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EDITED BY

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WITH THE ASSISTANCE OF

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VOL. II, CORRIGENDA.

Matto Grosso Erycinidae.

Page 210, No. 165, *Mesosemia sirenia* = two species.

sirenia nitida Stich. (1923), 2 ♂♂ 3 ♀♀.

subtilis Stich. (1909), 2 ♂♂ 1 ♀.

Although these species present a close resemblance to one another, they are quite distinct. All taken at Burity, and in June and July were taken together.

Page 210, No. 167, *Eurybia halimede elvina* = *elvina tephrias* Stich. (1915).

„ 211, No. 180, *Caria trochilus parva* = *trochilus phayla* Stich. (1916).

„ 212, No. 190, *Mesene phareus rubella* = *deliciosa* Stich. MS.

We are indebted to Dr. H. Stichel for pointing out the above inaccuracies.

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A CATALOGUE OF THE LEPIDOPTERA OF HAINAN.

(Continued from the BULLETIN OF THE HILL MUSEUM, Vol. II, p. 191.)

NOCTUIDAE.

BY MISS A. E. PROUT, F.E.S.

FOREWORD.

EXTREMELY few records of the Noctuidae of this island seem previously to have existed. Hampson, in his *Cat. Lep. Phal.*, records four or five species from Hainan, for one of which the Five-Fingered Mountains is the type locality. To this list Warren, in Seitz' *Macrolepid.* xi, adds about a dozen species which are represented in the Tring Collection, one of which he describes as new to science. Unfortunately his work ends abruptly at the end of the *Erastrinae*, except for three new species of *Acontianae* published in *Nov. Zool.*, xix and xxiii, bringing the previous records from Hainan known to us up to a total of twenty-two species. We are indebted to Mr. C. T. Bowring, with some assistance from Mr. Chun, for a collection of fifty-four different species of Noctuidae from the island.

One of the most interesting points about the collections made by Mr. Bowring is that only one of the species sent by him (*Mocis undata*) is among the twenty-two previously recorded species: the remaining fifty-three are therefore all apparently new records for Hainan. This suggests that we have as yet only touched the fringe of the *Heterocera* (or at least of the Noctuidae) of this island and that there still remains a vast amount of work to be done here.

The majority of the species received by us belong to widely distributed or to fairly common Indian species, but a few are rare species, or have a more unusual distribution; on these some comment is made in the following records.

One species (an *Anomis*) is described as new to science. One or two others may well belong to new species or subspecies, but there is either insufficient material to establish them or the condition is too poor to allow of their being published as new.

Next to the new species in interest is, perhaps, the single ♀ 

Enmonodia contractipennis de Joan., which appears to be the first ♀ on record and perhaps also the first specimen to represent the species in British Collections.

Our thanks are due to Mr. C. T. Bowring for this interesting addition to our knowledge of the fauna of Hainan and for his kindness in presenting the specimens to the Joicey Collection.

AGROTINAE.

(1) *Agrotis spinifera*

Noctua spinifera Hbn., Samml., *Eur. Schmett.*, Noct. f. 389 (1827) (Europe). Hoihow; April, 1920, one ♀.

(2) *Agrotis ipsilon*.

Noctua ipsilon Hufn., *Berlin Mag.*, iii, p. 416 (1766). (Europe.) Hoihow, April, 1920, one ♂.

HADENINAE.

3. *Meliana curvilinea*.

Leucania curvilinea Hmps., *Ill. Het. B.M.*, viii, p. 67, pl. 144, f. 3 (1891) (Nilgiris).

Mr. Bowring did not send this species.

ACRONYCTINAE.

4. *Dipterygia babooni* Beth.-Bak.

Nov. Zool., xiii, p. 197 (1906) (Brit. New Guinea).

In Seitz' *Macrolepid.*, xi, Warren records a single ♀ of this Papuan insect from Hainan. There is one specimen of *babooni* in the Joicey Collection from Buru, but I have not seen it from any locality west of the Moluccas, so that the above record is a curious one.

5. *Trachea consummata*.

Hadena consummata Wlkr., *Spec. Lep. Ins.*, xi, p. 591 (1857) (Port Natal).

Hoihow, May, 1920, one ♂; June, one ♀.

6. *Perigeodes poliomera* Hmps.

Cat. Lep. Phal., vii, p. 287, pl. cxv, f. 11 (1908) (Khasias).

Mr. Bowring did not send this.

7. *Perigea capensis*.

Apamea capensis Guen., *Spéc. Gén. Léop.*, v, p. 213 (1852) (Cape). Hainan, January, 1920, one ♂.

8. *Eriopus maillardi* Guen.

Maillard's Réunion, *Lép.*, p. 39, pl. 22, fig. 8 (1862) (Réunion).

We have not received this species from Hainan, but Warren, in Seitz' *Macrolepid.*, xi, records it from the island, without any exact locality.

9. *Eriopus duplicans*.

Callopietria duplicans Wlkr., *Spec. Lep. Ins.*, xii, p. 866 (1857) (Burma).

The note on the last species is applicable also to this and to the following species.

10. *Eriopus reticulata* Pagens.

J. B. Nass, *Ver.*, xxxvii, p. 226, pl. vi, f. 7 (1884) (Amboina).

See notes on Nos. 8 and 9.

11. *Prodenia litura*.

Noctua litura Fabr., *Syst. Ent.*, p. 601 (1775) ("E. India").

Hainan, April, 1920, one ♀.

12. *Spodoptera mauritia*.

Hadena mauritia Boisid., *Faun. Ent. Madag. Lep.*, p. 92, pl. 13, f. 9 (1893) (Mauritius).

Hoihow, January, 1920, one ♂; May, one ♂; September, 1920, one ♀.

13. *Laphygma exigua*.

Noctua exigua Hbn., *Eur. Schmett.*, Noct., f. 362 (1808) (Europe).

We have not received this species from the Island, but Warren, in Seitz' *Macrolepid.*, xi, records it from Hainan.

14. *Athetis placida*.

Radinaera placida Moore, *Lep. Ceyl.*, iii, p. 30, pl. 147, f. 4 (1884) (Ceylon).

See note on preceding species.

15. *Chasmina sericea*.

Clinophlebia sericea Hmps., *Ill. Het. B.M.* ix, p. 92, pl. 161, f. 7 (1893) (Ceylon).

"Hainan," May 31, one ♂; Yulinkang, October, one ♀; Interior of Hainan, one ♀.

16. *Callyna siderea* Guen.

Spéc. Gén. Lép. v, p. 113, pl. iv, f. 1 (1852) (Silhet).

Mr. Bowring did not send this species.

17. *Callyna monoleuca* Wlkr.

Spec. Lep. Ins., xv, p. 1667 (1858). (Bombay.)

Warren records this species from Hainan.

ERASTRIANAE.

18. *Eublemma roseana*.

Thalpochares roseana Moore, *Proc. Zool. Soc.*, 1881, p. 370 (Dharmasala).

Recorded by Warren from Hainan.

19 *Eublemma ochreola* Hmps. n.

Cat. Lep. Phal., x, p. 166, pl. cliii, fig. 23 (1910). (Hainan.)

Mr. Bowring did not send this species, of which the type came from the Five Finger Mountains.

20. *Eublemma crassiuscula*.

Thermesia crassiuscula Walk., *Journ. Linn. Soc. Zool.*, vii, p. 186 (1864) (Sarawak).

Hoihow, April, 1920, one ♀ ; August, 1920, one ♂ .

21. *Cerynea troglobasis* Hmps. n.

Cat. Lep. Phal., x, p. 209 (1910) (Queensland).

Hampson records this species from Queensland only, but Warren, in Seitz, gives it a much wider distribution, including India and Hainan.

22. *Oruza divisa*.

Selenis divisa Wlkr., *Trans. Ent. Soc.* (3) 1, p. 107 (1862). (Hindostan.)

Hoihow, April, 1920, one ♂ .

23. *Amyna modesta*.

Illatia modesta Warr., Seitz' *Macrolep.*, xi, p. 275 (1913). (Hainan.)

This species is unknown to me.

24. *Amyna punctum*.

Noctua punctum Fabr., *Ent. Syst.*, 3, 2, p. 34 (1794) (" E. India ").

Interior of Hainan, May, 1919, one ♂ . We have also seen one ♂ in the Hope Museum, from Hoihow, September.

25. *Lithacodia separata*.

Maliattha separata Wlkr., *Spec. Lep. Ins.*, xxvii, p. 86 (1863) (Sarawak).

Warren, in Seitz, records this species from Hainan.

26. *Naranga diffusa*.

Xanthodes diffusa Wlkr., *Spec. Lep. Ins.*, xxxiii, p. 779 (1865) (Ceylon).

This is also recorded from Hainan by Warren.

27. *Tarache marmoralis*.

Noctua marmoralis Fabr., *Ent. Syst.*, iii (2), p. 234 (1794).

This again is recorded from Hainan by Warren.

28. *Tarache disrupta* Warr.

Seitz' *Macrolep.*, xi, p. 304 (1913). (Hainan.)

This species is unknown to me.

EUTELINAE.

29. *Anigraea albomaculata* (?)

Eutelia albomaculata Hmps., *Moths Ind.*, ii, p. 393 (1904). (Sikkim.)

Hoihow, May, 1920, one ♀.

This specimen may well belong to a new species close to *albomaculata*, but the condition is too poor to allow of its receiving a name.

STICTOPTERINAE.

30. *Stictoptera subobliqua*.

Steiria subobliqua Wlkr., *Spec. Lep. Ins.*, xiii, p. 1136 (1857). (Ceylon.)

Interior of Hainan, May, 1920, two ♂ ♂.

ACONTIANAE.

31. *Hyposcota aurata* Warr.

Nov. Zool., xxiii, p. 212 (1916). (Hainan.)

This species is unknown to me.

32. *Earias flavida* Fldr.

Sitz., *Akad. Wiss. Wien*, xliii, p. 34 (1861). (Amboina).

Hoihow, May, 1920, one ♀; September, 1920, one ♀.

These two ♀ ♀ are almost entirely unlined and appear rather more citron-yellow in tone than the majority of *flavida* specimens; but similar variation occurs in some other *Earias* species and it is impossible without more material to say whether the above differences are racial or merely aberrational. This may even be an overlooked species closely related to *flavida*.

33. *Carea varipes* Wlkr.

Spec. Lep. Ins., x, p. 475 (1856). (Malacca.)

Nodoa (W. Young Chun) 24, xii, 1919, one ♂.

A fine dark form.

34. *Carea careoides* Warr., ab. *nigrimacula* Warr.

Nov. Zool., xix, p. 38 (1912) (Hainan).

This form is unknown to me. Warren calls it "ab." *nigrimacula*, but it may well be a distinct local race.

35. *Negeta abbreviata* Warr.

Nov. Zool., xxiii, p. 211 (1916). (Hainan.)

This species is unknown to me.

36. *Acontia transversa*.

Xanthodes transversa Guen., *Spéc. Gén. Lép.*, vi, p. 211, pl. 10, f. 5, (1852). (Java.)

Hoihow, July, 1919, one ♀.

CATOCALINAE.

37. *Cocytodes caerulea* Guen.

Spéc. Gén. Lép., vii, p. 41 (1852). (E. India.)

Interior of Hainan, May, 1920, one ♀.

38. *Agonista hypoleuca*.

Lygnoides hypoleuca Guen., *Spéc. Gén. Lép.*, vii, p. 125 (1852) (Silhet).

Interior of Hainan, July, 1919, three ♂♂, one ♀; May, 1920, one ♂; August, 1920, one ♂; September, 1920, six ♂♂. Hoihow, October, 1920, one ♂.

The Hope Museum has a single ♂ from the interior, dated July.

39. *Erebus hieroglyphica*.

Noctua hieroglyphica Drury, *Ill. Exot. Ins.*, ii, p. 3, pl. ii, f. 1 (1773). (Madras.)

Interior of Hainan, September, 1919, one ♀. Hoihow, June, 1920, one ♀. Interior of Hainan, September, 1920, three ♂♂, two ♀♀.

40. *Erebus caprimulgus*.

Noctua caprimulgus Fabr., *Spec. Ins.*, ii, p. 210 (1781). (China.)

Interior of Hainan, July, 1919, one ♀; May, 1920, one ♀; July, 1920, one ♂; August, 1920, one ♂; September, 1920, one ♂, two ♀♀; without date, one ♀.

41. *Erebus macrops*.

Noctua macrops Linn., *Syst. Nat.*, xii, iii, App., p. 225 (1768).
("E. India.")

Interior of Hainan, July, 1919, one ♀; September, 1919, two ♀♀;
"June" (without year), two ♀♀; undated, one ♀.

42. *Erebus crepuscularis*.

Noctua crepuscularis Linn., *Syst. Nat.*, ed. xii, 1, 2, p. 811 (1767).
("America.")

Nodoa (W. Young Chun), January, 1920, two ♂♂; February, 1920,
two ♀♀. Interior of Hainan, March, 1920, one ♂; August, 1920,
one ♀; September, 1920, two ♂♂, three ♀♀.

The four specimens from Nodoa show what may well be a slight
racial variation in the reduction of white on the underside of both wings,
one ♂ having no white at all beneath except the subterminal spot at
costa of fore wing and the other ♂ scarcely any.

43. *Entomogramma faultrix* Guen.

Spéc. Gén. Lépi., vii, p. 204 (1852). (Sylhet.)

Interior of Hainan, July, 1919, one ♀; March, 1920, one ♀;
June, 1920, one ♀.

44. *Enmonodia contractipennis* de Joan. (?)

Bull. Soc. Ent. Fr., 1912, p. 334. (Tonkin.)

Interior of Hainan, June, 1920, one ♀.

Note.—In the absence of the ♂, it is impossible to determine this
specimen with certainty, but it is distinguished from *E. unistrigata* Guen.
(which it closely resembles) by the shorter cell of the fore wing and, on
the hind wing, by the slightly shorter cell and more produced apex,
the more crenulate subterminal line (which is almost parallel with the
termen except at tornus) and by the marginal row of black dots being
scarcely connected by a pale line; in all of which points it agrees with
the figures of *contractipennis*. The apex of the fore wing appears
slightly more acute than in *unistrigata* and, on the underside, the
medial line is straighter (especially on hind wing).

A rare species, which, when Hampson's *Cat. Lep. Phal.*, xii,
was published, appears to have been known only by the ♂ type
(in Coll. de Joannis).

45. *Speiredonia retorta*.

Noctua retorta Linn., *Mus. Lud. Utr.*, p. 376 (1764). ("India.")

Interior of Hainan, July, 1919, one ♀ ; April, 1920, one ♀ ; June, 1920, two ♀ ♀ ; September, 1920, two ♀ ♀ .

46. *Lagoptera dotata*.

Noctua dotata Fabr., *Ent. Syst.*, iii, 2, p. 55 (1794) ("E. India").

Interior of Hainan, September, one ♀ .

47. *Anua coronata*.

Noctua coronata Fabr., *Syst. Ent.*, p. 596 (1775) (China).

The Hope Museum has one ♀ of this species from Hoihow, taken in August.

48. *Anua trapezium*.

Ophiodes trapezium Guen., *Spéc. Gén. Léop.*, p. 231 (1852) (Silhet).

Interior of Hainan, one ♂ .

49. *Achaea serva*.

Noctua serva Fabr., *Syst. Ent.*, p. 593 (1775). (New Holland.)

Hoihow, October, 1919, one ♂ . Interior of Hainan, September, 1920, one ♂ .

50. *Parallelia illibata*.

Noctua illibata Fabr., *Syst. Ent.*, p. 592 (1775). (India.)

Interior of Hainan, June, one ♀ .

51. *Parallelia joviana*.

Noctua joviana Stoll, in Cram., *Pap. Erot.*, iv, p. 237, pl. 399, f. B, (1782). (Coromandel Coast.)

Interior of Hainan, May, 1920, one ♀ .

52. *Parallelia maturata falcata*.

Ophiusa falcata Moore, *Lep. Ath.*, p. 171, pl. 6, f. 14 (1882) (Khasins) Hoihow, November, 1919, one ♂ .

Indian and Chinese specimens are almost certainly racially distinct from typical *maturata* Wlkr. (from Penang); it has therefore seemed necessary to re-erect Moore's name of *falcata*, which is sunk to *maturata* by Hampson in his *Cat. Lep. Phal.*, xii.

53. *Parallelia fulvotaenia*.

Ophiusa fulvotaenia Guen., *Spéc. Gén. Lép.*, vii, p. 272 (1852) (Silhet).

Hoihow, June, one ♂. Leanui, wet month, end of summer, 1920, one ♂.

54. *Parallelia stuposa*.

Noctua stuposa Fabr., *Ent. Syst.*, iii (2), p. 42 (1794).

Seven Finger Mountains, Hainan, September, 1920, one ♀.

55. *Parallelia crameri*.

Dysgonia crameri Moore, *Lep. Ceylon*, iii, p. 177, pl. 171, f. 2 (1885) (Ceylon).

Yulinkang, October, one ♀. Five Finger Mountains, Namfung (W. Young Chun), March, 1920, one ♀.

56. *Parallelia simillima*.

Ophusa simillima Guen., *Spéc. Gén. Lép.*, vii, p. 266 (1852). (Java.)

Interior of Hainan, April, 1920, one ♂.

57. *Euclidisema mygdon*.

Noctua mygdon Cr., *Pap. Exot.*, ii, p. 94, pl. 156, F. G. (1777). (Hab. Ign.)

Interior of Hainan, March, 1920, one ♂.

58. *Mocis undata*.

Noctua undata Fabr., *Syst. Ent.*, p. 600 (1775). ("E. India.")

Interior of Hainan, April, 1920, one ♂. Without date, one ♀.

PLUSIANAE.

59. *Plusia ochreatea* Wlkr.

Spec. Lep. Ins., xxxiii, p. 839 (1865). (Ceylon.)

Interior of Hainan, one ♀.

OPHIDERINAE.

60. *Sypna punctosa*.

Tavia punctosa Wlkr., *Spec. Lep. Ins.*, xxxiii, p. 939 (1865). (Hindustan.)

Interior of Hainan, May, 1920, one ♂, one ♀; June, 1920, one ♀.

61. *Sypna simplex* Leech.

Trans. Ent. Soc., 1900, p. 539. (Omei-Shan.)

Interior of Hainan, May, 1920, one ♀; June, 1920, one ♀.

Apart from the two ♀ ♀ listed above this species is only known to me from West China, and from a single ♂ in the Joicey Collection from Hunan, Central China; but as far as can be judged from specimens in somewhat imperfect condition, the Hainan form appears to agree almost perfectly with the Chinese.

62. *Hulodes caranea* Cr.

Phalaena noctua caranea Cr., *Pap. Exot.* iii, pl. 269, E. F. (1780) (Java).

Interior of Hainan, July, 1919, one ♂; September, 1920, one ♀, October, 1920, one ♂. Yulinkang, October, one ♀.

63. *Platyja unminea*.

Phalaena unminea Cr., *Pap. Exot.*, iii, pl. 267, F (1780). (Java.)

Interior of Hainan, July, 1919, one ♂. Yulinkang, October, one ♀.

64. *Calesia stillifera* Fldr.

Reise, ii, pl. cxvii, f. 18 (1874) (N. Philippines).

Hoihow, April, 1920, one ♂.

65. *Ommatophora luminosa*.

Phalaena Noctua luminosa Cr., *Pap. Exot.*, iii, pl. 274, D (1780). (Java.)

Interior of Hainan, May, 1920, one ♀; October, one ♀.

66. *Homodes crocea* Guen.

Spéc. Gén Lép., vi, p. 280 (1852). (Java.)

Interior of Hainan, one ♂.

67. *Fodina oriolus* Guen.

Spéc. Gén. Lép., vii, p. 274 (1852). (Silhet.)

Five Finger Mountains (W. Young Chun), May, 1920, one ♂.

68. *Gesonia obeditalis* Wlkr.

Spec. Lep. Ins., xvi, p. 75 (1858). (Ceylon.)

Hoihow, November, 1919, one ♂.

69. *Rhytiapermnestra*.

Phalaena Noctua hypermnestra Cr., *Pap. Exot.*, iv, p. 69, pl. 323, A, B (1780) ("Coromandel").

Interior of Hainan, one ♀.

70. *Othreis fullonica*.

Noctua fullonica Linn., *Syst. Nat.*, 1, p. 812 (1766). (E. India.)
Hoihow, August, 1920, one ♀.

71. *Anomis irene* sp. nov.

♂ ♀, 51-52 mm.

Head and palpus, buff. Thorax and fore wing, pinkish-buff to pinkish-cinnamon (Ridgeway, pl. xxix) faintly clouded with fuscous, though very smooth and glossy; lines indistinct, brownish-rufous, nearly, as in *fulvida* Guen. (Java), but even more indistinct, the postmedial rather more strongly angled inward at SM₂ and outward in fold and to hindmargin, the anterior half of subterminal rather more evenly crenulate; orbicular a sharply-marked white dot faintly ringed with rufous-brown; reniform represented by diffused fuscous spots at upper and lower angles of cell; fringe rather darker than the wing, tipped with white.

Hind wing above drab flushed with flesh colour, the ♂ with some pale buff androconia on proximal third.

Fore wing beneath whitish at margins, the whole centre of wing flesh colour slightly shaded with fuscous, the costa and anterior half of termen with some flesh colour irroration; a strongly curved postmedial line, obsolete on posterior half of wing, and a diffused dark patch at origin of subterminal. Hind wing beneath, whitish with pale flesh colour irroration on anterior third and with a weak, pale brownish postmedial line, obsolete on posterior half of wing.

Habitat.—Hoihow, May, 1920, one ♂ (holotype); August, one ♀ (allotype); Yulinkang, October, one ♂.

Hampson would probably have sunk this species to *fulvida* Guen., from which, however, it is abundantly distinct in the narrower, more elongate fore wing, the much narrower hind wing, with more flattened termen (especially in ♂) and in the coloration of both wings, *fulvida* being on the fore wing ochraceous-buff more or less strongly irrorated with ferruginous, on the hind-wing above hardly tinged with flesh-colour; the fore wing beneath is less distinctly shaded with flesh-colour and is darkened at termen in *fulvida*.

72. *Anticarsia irrorata*.

Noctua irrorata Fabr., *Spec. Ins.*, ii (Appendix), p. 506 (1781).
("E. India.")

Yulinkang, Hainan, October, one ♀.

73. *Psimada quadripennis* Wlkr.

Spec. Lep. Ins., xv, p. 1828 (1858) (Canara.)

Hoihow, October, one ♂.

74. *Oxyodes scrobiculata*.

Noctua scrobiculata Fabr., *Syst. Ent.*, p. 592 (1775). ("E. India.")

Nodoa, interior, August, 1920, one ♀.

The Hope Museum has one ♂ of this species, labelled only "September."

HYBLAEIDAE.

75. *Hyblaea firmamentum* Guen.

Spéc. Gén. Lép. vi, p. 392 (1852). (Silhet.)

Nodoa, Interior, August, 1920, one ♀.

Although there is very little doubt that Comstock (*Introd. Ent.*, p. 655), is correct in regarding the *Hyblaeidae* as a separate family rather than as a subfamily of the *Noctuidae*, *H. firmamentum* is, as a matter of convenience, included in the list of the *Noctuidae* of Hainan.

(*To be continued.*)

SOME NEW FORMS OF THE HYPENID GENUS

SIMPLICIA.

WITH FOREWORD AND NOTE ON *Simplicia (Culicula) bimarginata*.

BY MISS A. E. PROUT.

FOREWORD.

As this genus is not yet systematically worked out in the Brit. Mus. Coll. a note on its characteristics and on the forms embraced in it may not be out of place here.

Guenée, in his original diagnosis, distinctly states that the areole is absent in *Simplicia*, and Warren, in Seitz' *Macrolep.*, iii, follows Guenée. Hampson, in the *Moths of India*, iii (although he cites *rectalis* Ev. as type), says that the areole is "long and narrow, with vein 10 given off far beyond it in ♂, from it in ♀." As the ♂ and ♀ neuration seems rarely to vary much in one species this statement suggests some sort of confusion; but in any case Guenée and Warren, not Hampson, appear to be correct with regard to *rectalis* (the genotype). *Simplicia*, however, appears to be one of a small group of the *Hypeninae* in which the subcostals are in a state of flux. In the Indo-Australian and Chinese species (to which this paper is entirely confined) the most usual neuration is that cited by Hampson for the ♂; but one or two species agree with the type in having altogether lost the areole, whilst in one or two rare instances SC² has been drawn back to the areole instead of being stalked with SC³, SC⁴. Where the areole is absent SC⁵ is usually drawn back to the angle of cell. In *Bocana armatalis* Wlkr., for which Hampson has erected a new genus, SC⁵ is stalked with SC², SC³, SC⁴; but in spite of this difference, *armatalis* seems to me to be in all probability a *Simplicia*, the genitalia bearing a decided resemblance to that of *Simplicia (Aginna) circumscripta* Wlkr.; we have not yet had an opportunity to examine the genitalia of *S. rectalis*.

In spite of these different arrangements of the subcostals (which grade very naturally into one another) *Simplicia* forms on the whole a

very natural genus, the pattern being almost identical in a large number of the species; and although the few genitalia examined show strong specific variation they are agreed in having the valve somewhat solidly built, the uncus narrowed near base and somewhat swollen at middle.

The following diagnosis may be of use.

Palpus sickle-shaped; segment 2 strongly curved throughout, varying from about one and a half to nearly twice diameter of eye, smoothly scaled in front, with slight tuft of hair at distal end behind; segment 3 straight, acute, more or less tufted behind, varying from about one-half to almost length of segment 2. *Thorax* clothed chiefly with scales, with a little hair intermixed, without crests. *Abdomen* without crests. ♂ antenna ciliate, sometimes knotted and with a tuft of hair at about two-fifths shaft. ♂ fore leg with a strong sheath covering the tibia and a part or the whole of the first joint of the tarsus; this sheath, which varies considerably in length and build, is one of the best specific characters in the genus. Fore wing with the subcostals varying, venuration otherwise normal. Hind wing with R^2 from or from close to angle of cell; SC^5 , R^1 and R^3 , M^1 occasionally weakly stalked.

For genera which sink to *Simplicia* see *Moths of India*, iii, p. 35. Of these *Culicula* and *Nabarthia* must be referred to the same species, the types being almost certainly no more than local races (see Nos. 8 to 10 of this paper). This group is rather distinct both in the shape of the fore wing and in the genitalia, the valve showing a process at (and beyond) its distal end, which is wanting in the other valves examined; notwithstanding these differences, however, *Culicula* seems hardly separable from *Simplicia*.

The *Aginna* group are rather less slenderly built than most *Simplicia* species, with the scaling slightly rougher. In *circumscripta* (the genotype) the sheath on fore tibia is exceptionally long and broad, with a strong brush of hair on the outer side, and all the legs are somewhat unusually long; but although it may be regarded as typical of one group in the genus, the above characters are not sufficiently constant in the group to allow of generic separation.

1. *Simplicia solomonensis* sp. nov.

♂, 42—46 mm.

Structure nearly as in *Aginna circumscripta* Wlkr., with antenna knotted and tufted at about two-fifths shaft, segment 3 of palpus bent

backward (almost as long as 2), and with very large sheath on the fore leg, extending fully to the end of segment 1 of tarsus, fringed on outer side with hair. In *solomonensis* the fore wing is, however, much less elongate than in *circumscripta*.

Fore wing avellaneous, tinged with vinaceous-fawn and irrorated with deeper brown, which forms a dark shade proximally to the subterminal line. Markings about as in *circumscripta*, but the post-medial line rather more strongly bent outward from costa; the discal spot typically black but often defined only by a dark ring.

Hind wing nearly as in *circumscripta*, but slightly more tinged with vinaceous, with a broader dark shade before the subterminal line, which is rather further removed from the postmedial.

Underside somewhat as in *circumscripta*, but with heavier dark irroration, especially on distal half of wing; postmedial line rather stronger, more curved (especially on fore wing).

Habitat.—Solomon Islands: Gizo, ♂ holotype; New Georgia, one ♂, Rendova, one ♂. This species is also represented in the Tring Mus. Coll. by a long series of ♂♂ and ♀♀ from the following islands: Bougainville, Choiseul, Isabel, Treasury, Vella Lavella, Guadalcanar, in addition to the islands named above.

The ♀ differs from the ♂ chiefly in the absence of secondary sexual characters, the rather smaller average size and the somewhat darker (more purplish) and more uniform coloration.

S. solomonensis may be no more than a local race of *circumscripta*, but it is given specific rank on account of the very distinct difference of shape in the ♂.

2. *Simplicia stictogramma* sp. nov.

♂, 34 mm.

Antenna with small tuft at about two-fifths shaft. Palpus with the scaling on second segment thickened near proximal end, giving it a slightly quadrate appearance; segment 3 not quite as long as 2. Fore wing with a very narrow areole, clothed with yellow androconia, as in *turpatalis* Wlkr., but with the androconia not reaching to antemedial line on fore wing, absent on hind wing. Fore legs wanting.

Coloration somewhat as in *turpatalis*, but fore wing slightly more glossed with vinaceous, shaded with fuscous at and before termen. Differs from *turpatalis* and from nearly all other *Simplicia* species in having the subterminal line broken up into pale yellow spots (on the veins). Otherwise quite typical in pattern.

♀. Fore wing rather browner; hind wing more uniformly darkened than in the ♂.

Habitat.—China: Ya-chiao-ling, August, 1922 (C. T. Bowering), three ♂♂; Ichang, one ♀ (very poor).

A single ♀ in the Tring Mus. Coll. (from Digboi, Assam) has both wings beneath more darkened, with the postmedial line more strongly curved on fore wing, more waved on hind wing, but the dotted subterminal and rather strong fuscous shade at termen of both wings above render it almost certain that this is the true ♀ of *stictogramma*. The difference in the postmedial line beneath may be racial.

Note.—*S. turpatalis* is almost certainly quite distinct from *S. robustalis*, to which Sir G. Hampson sinks it in his *Moths of India*.

3. *Simplicia siamensis* sp. nov.

♂, 30—34 mm.

Antenna thickened and tufted at about two-fifths shaft. Palpus with segment 2 smoothly scaled and well curved; segment 3 fully two-thirds length of 2, tufted behind. Sheath on fore tibia rather small, hardly more than one-fourth length of costa, reaching to end of first segment of tarsus, which is apparently not dilated; tibia more or less aborted. Fore wing normal; areole very small, SC² well stalked with SC³, SC⁴, which are stalked to fully one-half. Hind wing with R³, M¹ strongly connate.

Head, thorax and fore wing avellaneous irrorated with darker brown; hind wing paler and greyer. Wing markings about as usual, but fore wing with a rather unusually distinct dark cell-dot, and with the antemedial line divided into two rather distinct lunules (slightly broken on M). Both wings beneath whitish thickly irrorated with brown, with well-defined dark cell-spot and moderately distinct postmedial and subterminal lines.

Habitat.—Siam: Bangkok (Dr. E. Milfred Barnes), four ♂♂.

Nearest to *S. caenusalis*, *Sophronia caenusalis* Wlkr., *Cat. Lep. Ins.*, xvi, p. 174 (1858) (Moreton Bay), with which it closely agrees in structure and size, but *siamensis* is at once differentiable by the much darker, browner tone of ground-colour and the distinct distal dot on the fore wing; the hind wing is also darker, more smoky in tone than in *caenusalis*.

4. *Simplicia macrotheca* sp. nov.

♂, 36—37 mm.

Antenna slightly knotted and tufted at nearly two-fifths shaft. Palpus with segment 3 almost as long as 2, rather densely tufted behind. Sheath on fore leg very long, fully two-fifths length of fore wing, extending to the end of segment 1 of tarsus, which is greatly produced, slightly dilated and tufted with hair; other four segments of tarsus all very short, tibia aborted; the sheath covered with dense hair. Fore wing with small areole, SC² well stalked with SC³, SC⁴.

In coloration and general aspect *macrotheca* closely resembles *niphona* Btlr.; the subterminal line generally a little more outstandingly pale, more contrasted with the dark ground-colour. Hardly separable except by the structure.

Habitat.—Sumatra: Medan, two ♂♂ (holotype); also one ♂ in the Joicey Coll. from Perak and one ♂ from Sarawak. There are also ♂♂ of this species in the Tring Mus. Coll. from the Malay Peninsula, Java and British N. Borneo.

In the ♂, *macrotheca* is at once distinguishable from *niphona* by the sheath on fore leg, which is unusually small in *niphona*, not reaching much beyond middle of the first segment of tarsus, the tarsal segments being of almost normal length and the tibia also apparently more normal than in *macrotheca*. In *niphona* segment 3 of palpus is shorter, only about two-thirds length of segment 2.

5. *Simplicia mesotheca* sp. nov.

♂, ♀; 41—46 mm.

♂. Antenna about as in *macrotheca* and *niphona*. Palpus about as in *niphona*. Sheath about one-third length of fore wing, the formation of leg much more as in *macrotheca* than in *niphona*, but segment 1 of tarsus more enlarged and flattened out. Areole rather narrow.

♂ ♀. Coloration and pattern a good deal as in *niphona*; the markings extremely weak, even the pale subterminal usually being rather weak; on the hind wing this line is often practically obsolete.

Habitat.—Dutch New Guinea: Mount Kunupi, Menoo Valley, Weyland Mountains, 6,000 feet, November, 1920, to January, 1921 (C., F. and J. Pratt), three ♂♂ (holotype), one ♀ (allotype). Also in the Joicey Coll. from Central Buru, one ♂, one ♀, and Cent. Ceram, ♂♂ and ♀♀. In the Tring Mus. Coll. there are a single ♂ and a

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series of ♀ ♀ from Mount Goliath, and ♀ ♀ from British New Guinea (Angabunga River and Biagi). Also a small, rather strongly marked ♀ from Mount Mada, Buru, which may probably belong here.

The majority of Moluccan specimens have a more distinct subterminal line on the hind wing than New Guinea ones; this may well prove a racial distinction.

6. *Simplicia niphona olivacea* subsp. nov.

♂, ♀, 36—41 mm.

Appears to agree perfectly in structure with *S. niphona* Btlr., from which it differs in the more distinctly ochraceous, almost olivaceous tone of the fore wing. In this respect *olivacea* differs from all other *niphona* races known to me.

Habitat.—Ceylon: Maskeliya, July, ex Coll. Alston, one ♂; also in the Joicey Coll., one ♀ from Patypola, ex Coll. Alston. The Tring Mus. Coll. has four ♀ ♀ from Ceylon, all showing the same olivaceous shade; also a ♂ and ♀ from the Nilgiris, which seems to belong to this race. The form *similis*, from Darjeeling is quite without the olivaceous tinge.

7. *Simplicia niphona superior* subsp. nov.

♂, ♀, 42—47 mm.

A fine, dark race with the yellow costa and subterminal line contrasting strongly with the purplish-brown ground-colour of fore wing. Other markings weak.

Habitat.—S. W. Sumatra: Slopes of Mount Korintji, 7,300 feet August-September, 1921, fourteen ♂ ♂, two ♀ ♀. The ♀ ♀ from Sarawak, Mount Murud (Mjöberg collections), listed as *niphona* may probably belong to this subspecies, but do not appear quite so fine.

Although the differences between these races are comparatively slight they appear constant, the three races *olivacea*, *similis* and *superior*, presenting quite a distinct appearance when placed side by side, so that it has seemed well to give them separate names.

8. *Simplicia bimarginata*.

Culicula bimarginata Wlkr., *Journ. Linn. Soc.*, vii, p. 178 (1864) (Sarawak).

By the kindness of Professor Poulton we have been permitted to see the type of *bimarginata* and find it entirely distinct from

schaldusalis, *Bocana schaldusalis* Wlkr., *Spec. Lep. Ins.*, xvi, p. 180 (1858) (Sarawak), to which Sir G. Hampson has sunk it in his *Moths of India*, vol. iii, p. 35. The two species can be at once distinguished in the ♂ by the densely hairy legs of *schaldusalis*, and by the swelling at base of costa and slightly concave termen of fore wing in *bimarginata*. They are also easily separable in both sexes by the broader, more ochraceous wings in *schaldusalis* and by the postmedial line, which is minutely and somewhat irregularly waved throughout in *bimarginata*, evenly excurved round the cell and scarcely waved in *schaldusalis*; the antemedial line is also more waved in *bimarginata*.

Simplicia infausta Fldr., *Reise Nov.*, Taf. cxx, fig. 45 (1876) (Sarawak), is almost certainly a synonym of *bimarginata*.

9. *Simplicia bimarginata marginata*.

Nabartha marginata Moore, *Lep. Ceyl.*, iii, p. 234, pl. 177, f. 2 (1885) (Ceylon).

Differs from typical *bimarginata* in the rather smaller size (about 38 mm.), more greyish-buff ground-colour and, especially, in the extra strong dark shading proximally to the subterminal line.

As *Bocana marginata* Moore, *Lep. Atk.*, p. 195, pl. vi, f. 19 (1882) (Darjeeling), is also a *Simplicia* species, it seemed at first as though the Ceylon form of *bimarginata* would require a new name; but *Bocana marginata* proves to be a synonym of *Herminia mistacalis* Guen., *Spéc. Gén. Lép.*, viii, p. 60 (1854) (Central India), the type of which is now in the Brit. Mus. Coll., so the name *marginata* is left free for the Ceylon race of *bimarginata*.

10. *Simplicia bimarginata rufa* subsp. nov.

♂, 47—51 mm.; ♀, 45—57 mm.; one doubtful ♀, 40 mm.

Differs from typical *bimarginata* in the larger average size (about 40—48 mm. in the type-form), and in the tone of ground-colour, which is distinctly more rufous as well as a little darker than in Sarawak specimens.

Habitat.—Dutch New Guinea: Nomnagihé, 25 miles south of Wangaar, 2,000 feet, January-February, 1921 (C., F. and J. Pratt), one ♂ (holotype) four ♀ ♀ (allotype). Also in the Joicey Coll. from the Arfak Mountains, Wandammens and Snow Mountains, and from British New Guinea (Hydrographers). The small ♀ cited above as "doubtful" is labelled "Mioswar Islands, Geelvink Bay": this is

surprisingly like the Ceylon form, but is probably correctly labelled (an aberration of subspecies *rufa*). Specimens from Rook Island, Rossell and Sud Est probably also belong here. Six ♀♀ from Kako Tagalago, Central Buru, are somewhat intermediate between typical *bimarginata* and subspecies *rufa*, but are provisionally placed with the latter. The Tring Mus. Coll. has also a long series of this form from Kei Island (one ♀), Dutch and British New Guinea, Goodenough, Sud Est, Rossell, Rock Island and the Solomons.

11. *Simplicia undicosta* sp. nov.

♂, ♀, 45—47 mm.

Differs from *bimarginata rufa* in the rather shorter and broader fore wing, which, in the ♂ is distinctly, in the ♀ very slightly, swelled at costa just before middle of wing as well as at the base, and differs especially in the venation of fore wing, where vein SC¹ is somewhat strongly curved in the ♂, very slightly so in the ♀, and SC², SC⁴ are rather more shortly stalked than in *bimarginata rufa*.

In coloration and pattern closely resembles a pale form of *bimarginata*, but the discal spots above and beneath are slightly more diffused, the lines usually weaker, especially beneath.

Habitat.—Central West Buru: Gamoe 'Mrapat, 5,000 feet, March-April, 1922 (C., F. and J. Pratt), 3 ♂♂, two ♀♀.

12. *Simplicia monocaula* sp. nov.

♂, 50—52 mm.

Antenna with moderate, curved cilia. Sheath short, about as in *niphona*, the tibia not strongly aborted, first segment of tarsus not dilated. Fore wing rather broad, the costa somewhat rounded but not swollen at base or before middle; apex well rounded. Areole absent; SC² stalked to about two-fifths; SC⁵ to nearly one-fifth.

Fore wing vinaceous-drab, with the termen pale (as in *bimarginata* and *undicosta*), and with a broadly diffused darker shade proximally to the subterminal line; lines obsolescent, apparently somewhat as in *bimarginata*; discal dot blackish.

Hind wing paler and more greyish, somewhat paler at termen, but less strongly contrasted than in *bimarginata* and *undicosta*. Underside almost uniformly suffused with fuscous, both fore and hind wing with very weak, little-curved postmedial and subterminal lines and rather stronger discal lumule.

Habitat.—S. W. Sumatra: Slopes of Mount Korintji, 7,300 feet, August-September, 1921 (C., F. and J. Pratt), one ♂ (holotype); also a ♂ from North Korintji Valley, 5,000 feet, September-October, 1921. A single ♀ in the Brit. Mus. Coll., also from Sumatra, placed by Sir G. Hampson under *schaldusalis*, appears to be the ♀ of this species.

Although the stalking of SC^5 with SC^2 , SC^3 , SC^4 , is a very rare feature in this genus, *monocaula* is unquestionably a true *Simplicia*.

13. *Simplicia aperta* sp. nov.

♂, ♀, 33—38 mm.

♂. Antennal ciliation short. Fore leg about as in *niphona*, with the sheath inconspicuous. Fore wing shaped somewhat as in *butesalis*, *Libisosa butesalis* Wlkr., *Spec. Lep. Ins.*, xvi, p. 187 (1858) (Sarawak), but rather more acute at apex. Areole absent; SC^5 free, from angle.

Coloration and general aspect not unlike the Indian form of *butesalis*, but the subterminal line is rather weaker and is distinctly bent behind SC^5 . Slightly more glossy than *butesalis*, with the lines even weaker and the hind wing a little paler.

Habitat.—Khasia Hills, Assam (Nissary), one ♂ (holotype) in the Joicey Coll. Two ♂♂, two ♀♀ from the same locality, in the Tring Mus. Coll., appear to belong here, and it is possible that a rather large, pale ♂ in the same collection, having the same structure, is merely an aberration of *aperta*. This specimen is likewise from the Khasias. In the Brit. Mus. Coll. there is a single ♂ of this species, placed under *turpatalis*.

Distinguished from both *turpatalis* and *butesalis* by the absence of areole.

14. *Simplicia anoecta* sp. nov.

♂, ♀, 27—36 mm.

Antenna about as in *aperta*. Sheath moderate, about one-third length of fore wing, compactly but rather broadly scaled; tibia aborted; segment 1 of tarsus long, apparently somewhat dilated, clothed with dense, long hair; the other four segments all short. Venation about as in *aperta*.

Fore wing typically a pale shade of Sayal Brown (Ridgway, plate xxix), more snuff-brown (*l.c.*) in one ♀; the lines very weak, even the

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yellow subterminal being slight and narrow; the discal spot unusually large, snuff-brown to bistre.

Hind wing pale greyish-brown, with slight traces of a pale subterminal. Wings beneath paler and rather more greyish-brown than above, with the markings obsolescent.

Habitat.—Labuan (Pryer), one ♂, two ♀♀. Not known to me in any other collection.

Like *aperta*, this species is distinguished from the majority of Indo-Australian *Simplicias* by the absence of the areole. The conspicuous brown discal spot gives it rather an unusual appearance.

NEW GEOMETRIDAE FROM BURU.

BY LOUIS B. PROUT.

ALL the species and subspecies described in the following article were collected for Mr. Joicey by Messrs. C., F., and J. Pratt in 1922. Their two principal stations, and the only ones to which reference is here made, were the following: Gamoe 'Mrapat, Central West Buru, 5,000 feet, March—April. Kako Tagalago, Central Buru, 2,700 feet, May.

All the types and allotypes are in the Hill Museum.

Subfamily HEMITHEINAE.

1. *Aeolochroma viridimedia* Prout *recta* subsp. nov.

♂, 44—45 mm.

Slightly smaller and perhaps slightly broader winged than *viridimedia viridimedia* Prout (1916) from New Guinea, the termen of the hind wing slightly more fully rounded.

Fore wing with the shape of the central fascia rather less extreme, more as in *suffusa* Warr. (1896). Hind wing with the cell-spot better developed, accompanied distally by some pale scaling. Underside with the postmedian line of the fore wing gently curved, the narrow white beyond it scarcely interrupted, the postmedian of the hind wing almost straight (type) or with a weaker outward bend behind middle than in the nearest allies (paratype).

Habitat.—Gamoe 'Mrapat, two ♂♂, unfortunately both rather worn.

A single ♀ from Manusela, Central Ceram, which doubtless belongs to the same or a closely connected race, has similar median band (allowing for the sexual difference) and the same straight postmedian line of hind wing beneath, but has the cell-spot of the fore wing enlarged, subocellate, as in *turneri* T. P. Luc. (1890), the ♀ of which is rather less large and much less green.

Subfamily GEOMETRINAE.

2. *Abraxas joiceyi* sp. nov.

♂, 40—44 mm.

Head orange, face black, with a narrow (rarely extended) orange area below. Palpus moderately stout but short; black; antennal ciliation moderate. Thorax and abdomen light orange, above spotted with black (the spots of abdomen rather large, mediodorsal). Fore leg blackened above and on inner side of femur and tibia; middle and hind legs blackened at the knee, the middle also more or less dark-spotted on outer side; hind tibia not dilated.

Fore wing with fovea slight; SC¹ wanting; white; extreme base marked with pale orange and black; costal margin brown-black nearly to cell-fold, almost absorbing the small cell-dot; a thick submarginal line about 2 mm. from termen, slightly thicker than that of *extralineata* Warr. (*Nov. Zool.* vi, p. 346), slightly more lunulate, a little incurved between M² and SM²; veins beyond (except SM²) darkening; a black terminal line, thinning at vein-ends; fringe slightly smoky, feebly spotted opposite the veins.

Hind wing without costal swelling, termen waved; subterminal and terminal lines as on fore wing, veins between less darkened; a small oblique dash at abdominal margin just proximal to the former.

Underside similar, more blackened beyond subterminal line; base of fore wing not mixed with orange.

♀, 45—47 mm. Almost like ♂, but with the face predominantly orange, only its extreme upper part black; space between subterminal and terminal lines whiter above and beneath.

The superficially similar *extralineata* Warr. has the typical *Abraxas* structure.

Habitat.—Gamoe 'Mrapat.

3. *Eucharidema joiceyi* sp. nov.

♂, ♀, 66—76 mm.

Head and body blackish-grey, collar paler, wing-tegulae with some brown admixture, anal tuft of ♂ paler, tinged with ochreous-brown. Legs (especially hind leg) also paler and more brownish; hind-tibial pencil of ♂ rather strong, predominantly pale brown.

Fore wing shaped nearly as in *arfaka* Joicey and Talbot (*Ann. Mag. Nat. Hist.* (8), xx, p. 79, pl. iii, fig. 1), the termen, on the whole, very

slightly less oblique, but with the tornus somewhat rounded off; coloration as in that species, red-brown, very heavily clouded with black, the black in the less dense parts breaking up into fine longitudinal striæ; a large black cell-spot distinguishable; subbasal pale line rather broad, but generally ill-defined; postmedian anteriorly not or scarcely mixed with white, perpendicular or very slightly oblique inward from costal bluntly angulated outward before R^1 and inward before SM^2 , the intermediate part forming a broad outward curve and somewhat lunulate, closely approximated to the subterminal between R^3 and M^2 (here often indistinct); subterminal rather slender (sometimes a little thickened costally), slightly incurved near its origin, strongly oblique inward from radial fold to R^3 , outward to a blunt angle between the medians, inward to M^2 , finally outward to tornus; the pale patch proximal to postmedian broad but generally feeble (in a rare aberration strikingly pale and conspicuous), containing near its distal end a bent and tapering black mark from costa; pale longitudinal patch to midtermen less developed than in *arfaka*; terminal black spots large, bounded proximally by an inconspicuous, crenulate pale line.

Hind wing dark grey, rather more variegated than in *arfaka*, having a conspicuous large round cell-spot, a broad anterior pale shade between this and the postmedian, and a blackish terminal area; the pale postmedian band less broadened and whitened anteriorly than in *arfaka*, bounded proximally by a wavy dark line throughout.

Both wings beneath blackish-grey, the fore wing with a very broad oblique orange band from close to costa, to close to tornus, its distal edge irregular and strongly convex, its proximal less so, bounded by or scarcely entering the cell.

Habitat.—Gamoe 'Mrapat.

Eucharidema salahuti Pagenst. (*Jahrb. Nass. Ver. Nat.*, xli, p. 170, Amboina, as "*Xandrames*") must be a nearly related species, but with different postmedian band, no subterminal line, browner hind wings, &c. I have not seen it, nor, indeed, hitherto any *Eucharidema* from outside New Guinea.

4. *Ctimene ocreata* Prout *brachypus* subsp. nov.

♂, ♀.

Fore wing with the markings more oblique than in *ocreata ocreata* Prout (1921, Ceram), the proximal edge of the broad black band reaching costal margin rather nearer base, generally rather straighter,

arriving at hindmargin close to tornus; subapical band with the foot-shaped terminal mark nearly always short, apex beneath orange, usually confluent with the subapical band, only with weak greyish irroration or suffusion for a short distance, the subapical band itself being wider than above.

Habitat.—Kako Tagalago, type and paratype ♂, allotype ♀; Gamoe 'Mrapat, two ♂♂, three ♀♀.

One ♀, also from the type locality, is an outstanding aberration, with the band very broad throughout (circ. 8 mm.), its proximal edge irregular, with a projecting patch of irregular black irroration behind the fold, the distal orange band narrow, much speckled with black; hind wing with the terminal border a little wider, preceded by some coarse black speckling; underside similar, the subapical patch almost black but leaving free the characteristic orange apex of the race. A ♂ from Kako Tagalago is asymmetrical in having, in the proximal yellow band of the fore wing both above and beneath, an oblong black spot of about 1 mm. width from M to behind fold.

5. *Myrteta cymodegma* sp. nov.

♂, ♀, 43—46 mm.

Face white, with the upper part (nearly one-half) vinaceous-rufous. Palpus more orange, at base pale. Vertex tinged with buff, with a vinaceous-rufous line behind. Antennal pectinations of ♂ long. Thorax and abdomen white. Fore and middle legs mixed with orange, brightest on the fore coxa. Hind tibia not dilated.

Fore wing with SC¹ out of C, the connection with SC² apparently entirely obsolete; white; costal edge infuscated nearly to apex; cell-dot brown, mixed with black; lines fine, browner, much as in *ocernaria* Swinh. (*Ann. Mag. Nat. Hist.* (6) xii, p. 152), or rather less bright, the very oblique antemedian slightly more denticulate outward on the veins and fold, the postmedian markedly lunulate-dentate (becoming punctiform on R¹ and SC⁵ but here less conspicuous than in *ocernaria*) often succeeded by a fainter, slightly less dentate line; terminal line and fringe as in *ocernaria*.

Hind wing similar to that of *ocernaria*, but also with rather fainter lines and with a tendency towards crenulation in the postmedian.

Underside white, with costal margin of fore wing and terminal line and fringe of both wings somewhat smoky.

Habitat.—Gamoe 'Mrapat (loc. typ.), three ♂♂, one ♀; Kako

Tagalago, two ♂♂. Also from Central Ceram, Manusela, 6,000 feet, one ♂, one ♀.

Apart from the subcostal venation, which may be inconstant, distinct structurally from *ocernaria* in the considerably longer pectinations.

6. *Nothomiza aquata* sp. nov.

♂, 35 mm.

Face dull red-brown. Palpus scarcely over 1, somewhat upcurved, distally mixed with blackish, at base white. Vertex and thorax above brownish (probably faded from greenish), abdomen paler; beneath whitish.

Fore wing slightly narrower than in *viridis* Warr. (*Proc. Zool. Soc. Lond.*, 1893, p. 386); cell rather longer, apex rather acute; SC¹ from close to end of cell (type) or shortly stalked (paratype); SC² long-stalked but separating just before SC⁵; water-green, with fine scattered red-brown (approaching cameo-brown) irroration, a suffusion of the same at proximal part of costa; costal edge with minute darker strigulae; cell-dot minute, black; lines almost obsolete, indicated chiefly at hindmargin; antemedian curved, arising from a costal spot at about one-fourth, postmedian reaching hindmargin obliquely (parallel with antemedian) nearer to antemedian than to termen.

Hind wing with termen rather more convex than in *viridis*; costal margin whitish-green, the rest concolorous with fore wing; a single brown line, reaching hindmargin about middle, straightish, becoming obsolescent anteriorly.

Underside whitish-green.

Habitat.—Gamoe 'Mrapat, two ♂♂.

7. *Plutodes discigera* Butl. *argenteilauta* subsp. nov.

♂, ♀. Differs from *Plutodes discigera discigera* Butl. (1880) in having a stronger admixture of silvery-white scaling on the costal area of the fore wing and bordering the leaden edges of the patches of both wings. The outer spot of both wings rather broader than in *discigera discigera*, with the red-brown line which crosses it rather more proximally placed.

Habitat.—Kako Tagalago, ♂ type, ♀ allotype, and five ♀♀ paratypes; Gamoe 'Mrapat, one ♀.

Malayan specimens are nearer to this race than to *discigera discigera*

in the increase of silvery scaling and often in a tendency for the blotches to broaden, but are rather intermediate and have the red-brown line usually as in *discigera discigera*.

8. *Synegia nephelotis* sp. nov.

♂, 31—33 mm.; ♀, 33—37 mm.

Head, with palpus, straw-yellow, clouded with cinnamon, the cinnamon scales of first palpal joint more or less tipped with dark grey; frontal cone acute; palpus almost 2. Antennal pectinations in ♂ 2—3. Thorax and abdomen concolorous with wings, collar-tippets with glossy deep-plumbeous scaling, abdomen above with the customary pale central spots, a slight plumbeous admixture on first segments.

Fore wing rather narrow, apex not acute, termen gently curved, not very long; SC¹ anastomosing shortly with C, SC² stalked, arising a little before SC⁶ and anastomosing quickly with SC¹, its base weak, probably sometimes obsolete; ♂ retinaculum bar-shaped, straw-yellow, spotted and clouded with cinnamon, the ground-colour showing chiefly in ill-defined bands proximally to the antemedian and distally to the postmedian and in parts of the central area; costal margin more reddish, spotted with dark grey and irrorated with glossy plumbeous or violet-grey; cell-dot black; markings grey, inclining to slaty, broad and cloudy; antemedian lunulate-dentate with the teeth directed inwards on M and SM²; postmedian dentate outwards on the veins, somewhat incurved between the radials and in submedian area; subterminal clouding fairly strong proximally, also behind apex and about R³—M¹ distally; terminal interneural dots black-grey; fringe spotted with dark grey between the veins.

Hind wing rather elongate costally, not very broad; concolorous with fore wing except costally, the markings of fore wing continued; basal area pale, with a blackish dot close to base.

Underside less brightly coloured; markings reproduced.

Habitat.—Gamoe 'Mrapat, five ♂♂, one ♀ (with type and allotype); Kako Tagalago, one ♂, seven ♀♀.

An aberration (one ♂, one ♀, Gamoe 'Mrapat) has the markings except anteriorly) much darker-slate colour, almost blackish-slate, with a corresponding blackening of base of abdomen above.

This species can hardly be a race of *imitaria* Walk. (1861, the wings being appreciably narrower, more as in *eumeleata* Walk. (1861).

9. *Synergia prospera* sp. nov.

♂, 38 mm.

Face and 2nd joint of palpus densely long-haired; 3rd joint of palpus elongate. Antenna long, nearly simple, pubescent (section *Eugnesia* Warr.). Head light brown, mixed with bright reddish-orange. Body nearly concolorous with wings, the abdomen above slightly greyer than the hind wing and with vague whitish spots. Fore leg darkened above.

Fore wing rather broad, apex not acute, termen very gently curved, very little oblique; $SC^{1,2}$ long-stalked, the stalk anastomosing with C a little proximally to the base of SC^5 , SC^3 , afterwards anastomosing with $SC^3,4$; orange-cinnamon, a little lighter and brighter just proximally and distally to the median area, mostly with rather coarse dark-grey substrigulate irroration; costal border strongly suffused with glossy dark-grey; cell-dot sharply black; lines blackish-slate colour; antemedian from quarter costa to one-third hindmargin, bluntly excurved at folds, incurved at SM^2 ; postmedian from about two-thirds costa to beyond two-thirds hindmargin, bluntly lunulate-dentate, with rather deeper inward curves between the radials and between M^2 and SM^2 ; subterminal indicated by weak proximal and still weaker distal shading or maculation; terminal line broken into interneural dashes; fringe weakly dark-mixed.

Hind wing ample, termen subcrenulate, especially anteriorly, strongly convex anteriorly, straighter posteriorly; costal edge whitish, the rest as fore wing, the cell-dot smaller, the antemedian obsolete.

Underside light ochraceous-salmon, more buff just outside the postmedian; markings deep neutral grey, stronger than above. ♀ similar but yellower, the dark markings beneath rather less coarse.

Habitat.—Kako Tagalago, 2,700 feet, May, 1922, allotype ♀. Gamoe 'Mrapat, 5,000 feet, March-April, 1922, type ♂.

10. *Corymica polysticta* sp. nov.

♂, 29 mm.

Head yellow, with a fine red line between the antennæ. Palpus rather elongate; dull red, at base pale yellow. Antenna dull red. Thorax yellow, posteriorly with a red dorsal line.

(Abdomen lost, probably as in *oblongimacula* Warr., *Nov. Zool.*, iii, p. 305.)

Fore wing fairly broad, apex minutely falcate, terminal tooth at R^1 very slight, hindmargin with the concavity and convexity rather strong;

fovea strong, but rather rounder (less long oval) than in most of the species; lemon-yellow, the vinaceous-tawny speckling in the middle of the wing rather coarse, on proximal part of costa rather strong and black-mixed, behind base of M^2 somewhat condensed, in anterior part termen forming a very narrow band, which expands between SC^6 and R^3 into an equilateral triangle, of which the apex is filled in by a large blackish spot; proximal half of costa with three small whitish (pallid-mouse-grey) dark-edged spots, the basal one elongate; hindmargin with similarly coloured minute triangle just beyond middle and redder-mixed mark (smaller than that of *arnearia* Walk., *List Lep. Ins.*, xx, p. 231), near tornus; cell-dot minute but encircled with vinaceous-tawny; terminal line and fringe much as in the allies.

Hind wing broad, the apex more rounded than in *oblongimacula*, the termen only feebly toothed at SC^2 , its posterior half rather full; abdominal area, as in *oblongimacula*, full, rugose, discoloured cinnamon-drab above, whitish beneath; rest of wing concolorous with fore wing; cell-spot large, cinnamon-drab; costa with a whitish midcostal triangle (narrow, but reaching SC^2) and a minuter spot distally, the latter giving rise to a curved postmedian series of large dots much as in *oblongimacula*.

Underside rather paler, with similar or rather redder markings.

Habitat.—Gamoe 'Mrapat, one ♂.

11. *Xenographia omorhusia* sp. nov.

♀, 25 mm.

Head pale yellow, at edges of face mixed with reddish. Palpus nearly 2; predominantly dark red-brown, at base mixed with yellowish. Collar red-brown. Thorax yellow, in front mixed with red-brown. Abdomen anteriorly pale yellow, posteriorly reddish-fawn.

Fore wing not very broad, costa gently arched proximally, apex moderate, termen not very oblique, bowed in middle; SC^2 fairly long-stalked, but arising before SC^6 (in *adustata* Moore long after SC^6); pale yellow, with extensive liver-brown to carob-brown markings; a broad costal streak from base to near middle more ferruginous; antemedian band irregular, mostly over 1 mm. broad, starting very narrowly at distal end of the red costal patch, projecting outward strongly in end of cell, then oblique inward and somewhat sinuous; median yellow area about 3 mm. broad, constricted about the folds, marked with rather asymmetrical brown cloudings (chiefly longitudinal) except at posterior

end; postmedian band broad, its proximal edge excurved in anterior half, slightly incurved about M^2 , its distal connected with termen by dark clouds, which leave free an oblique tapering apical spot and a moderate midterminal patch; fringe sharply chequered.

Hind wing not very broad, termen convex, with a slight sinus between the radials and a scarcely noticeable one between M^2 and tornus; nearly unicolorous fawn, tinged with vinaceous; fringe between the veins rather paler.

Fore wing beneath clay-colour in central area, more rufous in proximal part, greyer distally, pale-mixed at margin, especially at apex and in posterior half; no definite markings. Hind wing whitish, with copious sorghum-brown or deep vinaceous-drab irroration, cell-dot and narrow curved postmedian band.

Habitat.—Gamoe 'Mrapat.

12. *Nadagara juvenescens* sp. nov.

♂, 36—37 mm.

Head and front of thorax rufescent, mixed with blackish, the rest of the body and the legs a little paler, scarcely more reddish than in *juventinaria* Guen. (1858). Hind tibia dilated, with hair pencil.

Fore wing slightly more elongate apically than in *juventinaria*; more rufescent and with the irroration darker, the distal area concolorous with the rest, except for an ill-defined and inconstant pale patch at apex; antemedial line as in that species (gently curved, falling almost vertically on hind margin) but rather more sharply expressed; cell-dot small, sharply black; postmedian placed almost as in *juventinaria*, perhaps very slightly more oblique, its anterior curve slight, only commencing close to costa; the whitish line which bounds it distally thin.

Hind wing concolorous: cell-dot as on fore wing; postmedian slightly finer and straighter than in *juventinaria*.

Underside closely similar to that of *juventinaria*, the distal cloudings more reduced than in Guenée's type (Oberth. *Ét. Lép. Comp.*, vi, fig. 1480), on hind wing almost obsolete.

Habitat.—Gamoe 'Mrapat, 3 ♂♂.

Possibly a form of *juventinaria*. Oberthür (tom. cit. p. 263) says he has received the latter from Bomfia, Ceram.

13. *Nadagara cinctipuncta* sp. nov.

♂, 28—29 mm.

Smaller than the preceding. Hind legs in both examples lost, but

the presence of a long, slender spine over the abdominal orifice shows that the tibia will be dilated, with hair pencil.

Fore wing less uniformly rufescent than in *juvenescens*, the irroration (strigulation) still darker; antemedian line almost obsolete, more obliquely placed; black cell-dot relatively rather larger, encircled with white (more broadly distally than proximally); an ill-defined dark grey cloud beyond, reflecting the black patch of underside; postmedian line reddish, very slenderly whitish-edged distally, minutely crenulate, its posterior half forming a very slight inward curve; termen with blackish interneural marks.

Hind wing with costal area whitish, the rest concolorous with fore wing; cell-dot large, with ill-defined whitish circumscription; postmedian rather more proximal than in *juvenescens*, thick, slightly curved inward in front of R^3 , almost immediately becoming obsolete; a vague grey band beyond it; terminal black marks rather more elongate than on fore wing.

Fore wing beneath white posteriorly, otherwise rufescent, with blackish strigulae; cell-dot as above; beyond it a black patch from costa to cellule 3 and reaching distally as far as the (obsolescent) postmedian. Hind wing similarly coloured, but with the whitish area confined to the extreme abdominal margin; cell-dot nearly as above; postmedian line much more distally placed than above (midway between cell-dot and termen); strengthened by some blackish scaling and accompanied proximally between the radials by a small black patch.

Habitat.—Gamoë 'Mrapat, two ♂♂.

In my key to the genus *Nadagara* (*Ins. Samoa*, iii (3), pp. 164-5) this species will be separated at the top of p. 164: "Fore wing with the cell-dot encircled with white"; on p. 165, both it and the preceding will be added to *dohertyi* Prout, as further Moluccan representatives of Group II.

14. *Zeheba dystactocrossa* sp. nov.

♂, 44-46 mm.; 1 ♀, 40-44 mm.

Head and body coloured as in *lucidata* Walk. (*List Lep. Ins.*, xxvi, 1651) or very slightly paler. Fore wing with the terminal tooth at R^3 rather sharper than in that species and *spectabilis* Butl. (*Proc. Zool. Soc.*, Lond., 1877, p. 474), hind wing in both sexes markedly dentate.

Fore wing pale as in *spectabilis*, or recalling the subdiaphanous condition of *Krananda semihyalina* Moore (1867); costal edge and

distal border pinkish-buff or light pinkish-cinnamon, in the ♂ slightly varied, in the ♀ almost entirely clouded with deep brownish-vinaceous or vinaceous-brown; cell-mark dark; lines much as in *spectabilis*, the median more distally placed, generally well developed, the postmedian—which in *lucidata* is almost regularly curved, in *spectabilis* almost straight from costa to R³ or M¹—irregularly excurved between costa and M² and slightly crenulate; behind M² markedly incurved.

Hind wing and underside with similar distinctions, the borders beneath on the whole more darkened than in *spectabilis*.

Habitat.—Gamoe 'Mrapat, seventeen ♂♂, four ♀♀.

15. *Ectropis melancroca* sp. nov.

♂, 35 mm.

In antennal structure, wing-shape, venation (stalk of SC^{1,2} from cell), general coloration and markings similar to *bhurmitra sabulosa* Warr. (1897). Distinguished primarily by the absence of hind-tibial hair-pencil. Palpus with very little black scaling on first joint. Abdomen black dorsally, except at base and anal extremity.

Fore wing with both lines thickened, heavily blackened; a longitudinal black streak (thick line) behind cell-fold and R², starting about 6 mm. from base and ending at the paired radial spots of subterminal.

Hind wing with the postmedian blackened.

Fore wing beneath more distinctly marked than in *bhurmitra* Walk. (1860).

Habitat.—Gamoe 'Mrapat, the type only.

16. *Ectropis pallidistriga* (Warr.), *mixtistriga* subsp. nov.

Distinguished from name-typical *pallidistriga* Warr. (*Nov. Zool.*, x, p. 400, British New Guinea) in that the buff outer stripe is much narrower, the proximal half (approximately) being covered with red-brown (hazel to kaiser-brown irroration).

Habitat.—Gamoe 'Mrapat, one ♂, including the type; Kako 'Tagalago, one ♂, worn.

17. *Ectropis (Ruttelerona) obsequens* sp. nov.

♂, 50—53 mm.

Very similar to *lithina* Warr. (*Nov. Zool.*, x, p. 398, British New Guinea). Larger.

Fore wing slightly broader; lighter and brighter (more tinged with

clay-yellow or ochreous), the median area much less irrorate, on an average broader; antemedian line sharper, with less dark shading proximally; median shade with the same characteristic dark longitudinal mark along the base of R^1 , but much less oblique anteriorly (i.e., without the dark dash along SC^{3-5}), the rufous, black-mixed, or almost wholly black patch in middle of wing large and strong; postmedian rather less oblique, but slightly more sinuous, showing a very gentle outward curve between the radials and inward curve between this and the tooth at SM^2 , without the deeper bay between M^1 and SM^2 which is developed in *lithina*; subterminal with the anterior whitish dots rather strong but with the continuous posterior part, so characteristic of *lithina*, less straight and much less sharply developed, placed slightly farther from termen.

Hind wing rather variable, with little constant difference from that of *lithina* except in coloration; subterminal posteriorly—as on fore wing—weaker and less straight.

Underside with corresponding distinctions.

The hind tibial hair pencil and abdominal spine are strong. The first subcostal of the fore wing (SC^1 and SC^2), in the specimens denuded, is forked near its extremity, but with the anterior branch (remnant of SC^1) very weak or incomplete.

♀, 52—55 mm.

Closely like the ♀ of *lithina*, the paler parts a little lighter, the black cloudings at least as strong. Markings similar in direction to those of the ♂, much less distinct on account of the heavy suffusions.

Habitat.—Gamoe 'Mrapat, seven ♂♂, three ♀♀. Also from Central Ceram, one ♂ at 3,000 feet, October—November, 1919; seven ♂♂ at 4,600 feet, January, 1920; one ♂ at Manusela, 6,000 feet, October—December, 1919.

18. *Racotis cogens* sp. nov.

♂, ♀. 48—56 mm.

Extremely like *inconclusa* Walk. (1860), on an average somewhat larger. Antenna of ♂ with the segments appreciably dentate from the base, the teeth by the 8th or 9th segment becoming as long as diameter of shaft, then for a distance further increasing somewhat in length (true parallel-sided pectinations) from about the 36th, the 40th again diminishing from diameter of shaft to mere vestiges.

Head and body rather more ochreous-tinged than in *inconclusa*, the first segment of the abdomen with the dorsal shading bright rufous.

Upperside scarcely distinguishable from that of *inconclusa* except by its brighter aspect, the ground-colour being more ochreous, with an olivaceous tinge in places, the dark irroration and maculation more rufous, almost entirely without black admixture except in the costal and terminal spots and slightly in the vein-teeth of the postmedian, etc.

Fore wing beneath with the submarginal band much fainter and narrower than in *inconclusa*, well separated from termen (in posterior half with the ground-colour terminally fully as wide as the band), tinged with dull red-brown.

Hind wing beneath with the band similarly or still more strongly reduced, commonly almost evanescent.

Habitat.—Gamoe 'Mrapat, ten ♂♂, including type, one ♀ allotype; Kako Tagalago, two ♂♂.

19. *Cleora apista* sp. nov.

♂, ♀, 42—52 mm.

Almost exactly like *C. illustraria anestiaria* (Swinh., 1915, New Guinea), of which I should confidently describe it as a race but for the pronounced difference in the ♂ genitalia. On an average somewhat smaller, especially on Buru. Strongly marked, the median line generally broader and brighter than in the subspecies named; colour variations identical. Underside with the dark borders broader. In the ♀ nearly or quite reaching the postmedian, in the ♂ reaching the postmedian (as in *illustraria* and its races), but with some suffusion between this and the median, so as at times to recall that of *determinata* Walk.

Habitat.—Buru: Kako Tagalago, three ♂♂, three ♀♀, including type and allotype; Gamoe 'Mrapat, two ♂♂, one ♀. Central Ceram: Mamisela, 6,000 feet, October—December, 1919, eight ♂♂, two ♀♀; 4,600 feet, one ♂; 3,000 feet or one ♂.

The ♂ valve has the armature of its upperside broad, as in *illustraria*, but tapering abruptly to a single small point at its distal, and whereas the armature of *illustraria* is deeply excised distally, the upper lobe bearing a single spine, the lower a rather long slender one and a short blunt one.

This species will probably prove to be the "*B. acaciaria* Bdv.," of Holland, *Nov. Zool.*, vii, p. 580.

20. *Cleora sevocata* sp. nov.

♂, 43—50 mm.

Exceedingly similar to the preceding. Smaller. Palpus with

terminal joint elongate, exposed, at least as long as in *apista*. Antennal structure similar, the primary pectinations very long and curved, the short slender secondary ones developed, the apical third of shaft nearly simple. Abdomen with dark anterior belt scarcely ever well developed, usually shading off, when present, into a dusky posterior clouding.

Fore wing not quite so elongate as in *apista*; cell-mark narrower, less prominently surrounded by black shading, its proximal extension, when present, generally very small or isolated by a black line so as to form a separate dot or spot; lines less oblique, particularly the ante-median; median nearly always strong; postmedian forming a longer and narrower prong outward than in the allies; a white band generally developed between the postmedian and the subterminal; midterminal pale spot generally extended proximally so as to become confluent with the subterminal.

Hind wing slightly narrower and more elongate than in the allies, termen with the crenulations rather weak; basal not so sharply paler than median area as in the allies, commonly almost concolorous.

Underside quite distinctive, that of *determinata* Walk., *apista* Prout, &c., being almost uniformly blackened in the broad distal area, only with sharply white midterminal and apical spots, whereas that of *sevocata* is sordid drab, shaded with grey, with traces of alternately darker and paler bands, the midterminal pale spots quite weak; proximal area also less contrasted than in *apista*, having little or no white admixture; cell-spot much less large; postmedian line of both wings rather thick and conspicuous, on hind wing only bluntly angled outside cell-spot.

♀ less sharply marked above than those of the allies and perhaps distinguishable by the smaller cell-spots. Beneath with the cell-spots reduced and the broad dark borders greatly reduced, generally scarcely developed except in the apical region of the fore wing.

Habitat.—Gamoe 'Mrapat, seventy-six ♂♂, twenty ♀♀, Also from Manusela, Central Ceram, 6,000 feet, thirteen ♂♂, twenty-three ♀♀; 4,600 feet, two ♂♂; 3,000 feet, one ♀.

Variability fully as great as in the allies and along similar lines, the ♂♂ nearly always sharply marked, the postmedian longitudinal streak at and behind R³ of the fore wing commonly a pronounced feature, extended proximally so as to join the median shade, much as in *injectaria vittata* Warr. (1899), &c.

This species will probably prove to be the "*Boarmia concentraria* Snell." of Holland, *Nov. Zool.*, vii, p. 580.

21. *Cleora subbarbara* sp. nov.

♂, ♀, 35—40 mm.

Head predominantly pale, the projecting scales in front of fillet darker; face with rather dense tufts. Palpus nearly 2, 3rd joint rather elongate, particularly in the ♂, in which it is slightly fusiform; 1st and 2nd joints heavily infuscated on outer side. Antenna rather long, about three-quarter length of fore wing; in ♂ pectinate to seven-twelfth, the primary branches rather long, somewhat curled, the secondary ones rather short, slender. Collar-tippets and usually part of wing-tegulae darkened. Pectus densely hairy. Hind tibia of ♂ strongly dilated, with dense hair-pencil, terminal spurs short; tarsus abbreviated (rather less than half). Abdomen dorsally with paired dark spots and with slight suggestion of minute pale crests between them.

Fore wing not very broad, termen slightly less long and oblique than in *njöbergi* Prout (1926); SC¹ and SC² free; fovea in ♂ well-developed; white, irrorated or almost entirely covered, or covered except in narrow bands (the most constant being outside the postmedian, the next in frequency inside the antemedian) with blackish-fuscous, as variable as in *alienaria* Walk., *sevocata* Prout, *njöbergi* Prout, &c.; more or less bright zinc-orange or tawny suffusion on parts of SM², R¹ and most of the veins in terminal area; cell-mark narrowly lunular, with light blue-grey centre; lines black; antemedian from two-seventh costa to one-third hindmargin, slightly sinuous; median (when present) just proximal to cell-mark, anteriorly lost in dark clouding around the cell-mark; postmedian rather proximal, dentate, usually strengthened on the veins, indented behind SC⁵, angled outward at R², incurved between this and SM²; a complete or interrupted dark band between the postmedian and the outer white band; subterminal rather irregular, lunulate-dentate, generally interrupted by a pale patch in middle, some dark shading proximally and a more or less developed patch distally between pale subapical streak and pale central patch; termen with black interneural dashes or short lunules; fringe dark-mottled between the veins.

Hind wing with costal margin elongate, about as *njöbergi*, terminal crenulation not deep; light drab, the hair towards abdominal margin slightly more buff, the surface, unless at base and costal margin, pretty evenly irrorated with grey; markings feeble, grey, consisting of an ocellated cell-mark, a crenulate and slightly sinuous postmedian and a proximal subterminal shade; the subterminal and sometimes a vague

stripe between this and the postmedian more or less pale; terminal lunules present, but not intense.

Both wings beneath nearly as hind wing above, but with the fore wing more clouded, especially in its central part.

Habitat.—Gamoe 'Mrapat, nine ♂♂, nine ♀♀. Also from Central Ceram, 3,000 feet, one ♂; 4,600 feet, two ♂♂, one ♀; and Manusela 6,000 feet, seven ♂♂, nine ♀♀.

The wing-shape, the weakly marked hind wing and the general variability of the fore wing recall to mind the New Zealand genus *Pseudocoremia*, and this is enhanced in the case of the form with a single (outer) white band, which seems prevalent in Ceram and shows very closely the colouring and general effect of *Pseudocoremia leucelaea* (Meyr. 1909). The true affinities are undoubtedly with *C. alienaria* group.

22. *Oleora nigriscripta* (Warr.) *gavisa* subsp. nov.

Extremely variable, but regularly distinguishable from Warren's New Guinea race (*Nov. Zool.*, x, p. 401, as *Poecilalcis*) by the strongly dusted hind wing, which often develops an ill-defined, or even a definite, dark distal border; beneath also well dusted. The median area of the fore wing is often solidly dark; the white line or band which bounds it is nearly always narrow, but in some ♀ aberrations the entire proximal area and the distal from the postmedian to near termen are clear white, in which case the line is indistinguishable.

Habitat.—Gamoe 'Mrapat, 5,000 feet, March-April, 1922, twelve ♂♂, nine ♀♀.

23. *Catoria olivescens* Moore *longistigma* subsp. nov.

♂, 43 mm.

Fore wing slightly narrower than in *o. olivescens* Moore (*Lep. Coll. Atk.*, p. 244); ground-colour whiter, the mottling slightly greener (light greyish-olive).

Hind wing with the discal ocellus narrower and more elongate, rather strongly darkened.

Underside more heavily and deeply suffused with grey, the borders broader, though ill-defined proximally, the terminal marks white, sharply contrasted.

Habitat.—Kako Tagalago, one ♂, type.

A ♂ from Manusela, Central Ceram, is larger (size of average *olivescens*) but otherwise identical.

The large ♀ collected by Mr. Toxopeus and determined by me (*Treubia*, vii, in the press) as *camelaria* Guen. (1858), shares with this form the elongate cell-mark of the hind wing, but differs in width of wings, non-dentate second postmedian line, underside, &c.

24. *Catoria saturata* sp. nov.

♂, 37—41 mm.

Head and body concolorous with wings; vertex sometimes a little lighter. Hindtibial pencil strong; abdominal spine long.

Fore wing moderately broad; stalk of $SC^{1,2}$ anastomosing or connected with C, SC^2 subsequently with $SC^{3,4}$; much darker than the other species, between olive-brown and deep olive, slightly variable, sometimes with a few small, ill-defined whitish spots; some of the veins generally with some pale dots; cell-spot black, moderately large; lines indistinct, strongest and blackest at costa; antemedian double; median excurved or outbent subcostally, then oblique inward, generally touching the posterior side of cell-spot distally, posteriorly scarcely traceable except on the veins; postmedian at nearly two-thirds, double, much as in the other *Catoria*, not or scarcely excurved anteriorly, well incurved between M^1 and SM^2 , both series marked by vein-spots, the proximal rather well developed, the distal more variable and irregular, often enclosing pale dots or dashes on the veins; subterminal also macular, generally with fairly large dark spots proximally; terminal dots black.

Hind wing often slightly paler basally or costally; cell-spot somewhat ocellated, but rather small and weak; antemedian line often indicated at abdominal margin; median shade often distinct, straightish, from SC to abdominal margin, where it joins the postmedian; outer markings corresponding to those of fore wing.

Underside grey, inclining to hair-brown; cell-spot moderate, blackish; costa of fore wing with some pale strigulation or punctuation; both wings with pale subterminal and its accompanying markings; in paler examples the postmedian and terminal markings also distinct.

♀ on an average slightly larger, less dark, occasionally a good deal mottled with white.

Habitat.—Gamoe 'Mrapat, seventeen ♂♂, fifteen ♀♀.

Occurs also at Manusela, Central Ceram, 6,000 feet, October-December, 1919 (C., F., and J. Pratt), two ♂♂, four ♀♀, possibly a differentiable race, on an average larger and less dark.

25. *Boarmia (Serraca) notaticosta* sp. nov.

♂, 52—59 mm.

Structure about as in *infausta* Walk. (1866), but with the specialized hair of the abdominal region of the hind wing confined to the margin itself, as in *costaria* Guen. (1858). Head and body concolorous with wings; face, palpus and fore leg darker.

Fore wing slightly narrower than in *infausta*, shaped as in *costaria*; tone more violet-grey than in *infausta*, more as in *punctinalis* Scop. (1763) or *cineracea* Moore (1888); markings as in *roboraria* Schiff. (1775), but arising from intenser black costal spots, the median one strengthened, not—as in most *roboraria*—the weakest; median shade almost confluent with postmedian at the blackened posterior end; proximal subterminal shades not very strong.

Hind wing distinguishable at once from that of *infausta* by having the termen less strongly crenulate, the cell-spot punctiform and weak.

Underside much as in *cineracea*, but with the cell-marks small, on the fore wing strigiform or slightly crescentic, on the hind wing punctiform; subterminal rather weak and diffuse.

Habitat.—Kako Tagalago, type and a paratype; Gamoe 'Mrapat, one ♂.

Probably *Serraca* might be regarded as a genus, characterized by the long stalking of SC^{1+2} of the fore wing, with the stalk connected by a bar with C, in addition to the secondary sexual modification of the ♂.

26. *Boarmia cladara* sp. nov.

♂, ♀, 40—42 mm.

Face smooth, fuscous, narrowly pale at edges. Palpus $1\frac{1}{2}$, scarcely at all upcurved, terminal joint quite short; darkened on outer side. Antenna of ♂ with pectinations very long; a short apical part (about one-eighth) simple. Head and body concolorous with wings. Hind tibia of ♂ dilated, with light-brown pencil; tarsus about two-thirds tibia.

Fore wing not broad, termen scarcely waved, very slightly curved, strongly oblique; fovea not very strong; SC^{1+2} in the ♂ rather long-

stalked, a bar from their bifurcation running backward to C, in the ♀ coincident, anastomosing with C (in one ♂, SC¹ has been captured by C, producing the *Medasina* venation); white with a faint creamy tinge, in most parts with dark irroration or short strigulation, a mid-subterminal spot in some examples, a narrow band midway between postmedian and subterminal remaining clear; cell-dot black, large but not ocellated; markings fuscous, or inclining to bistre; oblique basal and subbasal clouding; principal lines highly oblique posteriorly, ante-median formed much as in *B. (Serraca) transcissa* Walk. (1860); median also shaped much as in that species, but heavier and somewhat more proximal in the ♂ ♂ with the acutely angulated part closely embracing the cell-dot; postmedian from a black dot beyond two-thirds costa, forming sharp teeth on the veins, anteriorly almost obsolete between, at R¹ somewhat angled outward, between M¹ and SM² slightly incurved; the brown shade outside the postmedian scarcely brighter, narrow but strong, slightly interrupted at the veins; subterminal deeply lunulate-dentate, with a very slender dark shade or row of spots distally and with larger and stronger spots proximally between the radials and from M¹ hindward, weaker ones (on dark irroration) between costa and SC⁵; terminal dots sharp; fringe weakly mottled.

Hind wings with termen waved, most strongly in middle; markings of fore wing mostly continued; median line almost straight, proximal to cell-dot; white band between postmedian and subterminal rather conspicuously broad and clear, excurved anteriorly; terminal line more lunulate.

Hind wing beneath dirty-whitish, inclining to tilleul-buff, slightly more vinaceous or greyish distally; only the cell-dot distinct. Fore wing beneath more vinaceous-buff, clouded with greyish and with a more ochreous buff, blackish-spotted costal margin, recalling that of *notaticosta* Prout (*supra*).

Habitat.—Kako Tagalago, type ♂, allotype ♀ and two ♂ ♂ paratypes.

This is one of the species which make me hesitate at present to separate *Serraca* generically; it has almost certainly some fairly near relationship, but lacks the hair-tuft of the ♂ hind wing beneath, has more porrect palpus than most of the group, and differs in some other details.

27. *Hemerophila canidorsata* Walk. *instigata* subsp. nov.

♂, ♀. Paler and more sharply marked than *C. canidorsata* Walk.

(1866), the cell-dots rather large, the angles in the lines, especially in the ♂♂, sharpened, the shades proximally to the antemedian of the fore wing and distally to the postmedian of the hind wing in the ♂♂ black rather than brown.

Habitat.—Gamoe 'Mrapat, two ♂♂, one ♀.

Except in the slightly less elongate costa, this superficially recalls *subplagiata* Walk. (1860) more than *canidorsata*, but the ♂ has the specialized scaling of the hind wing beneath—coloured as in the ordinary Khasi forms of *canidorsata*.

28. *Clepsimelea phryganeoides* Warr. major subsp. nov.

♂, ♀, 31—36 mm.

Considerably larger than *C. phryganeoides phryganoides* Warr. (Nov. Zool., v, p. 261, New Guinea), rather more brownish, decidedly more variegated, the dark costal spots of the fore wing larger, the pale markings, notably in the median area, stronger.

Habitat.—Gamoe 'Mrapat, eleven ♂♂, eight ♀♀, including type ♂ and allotype ♀; Kaku Tagalago, one ♂, two ♀♀. Also from Central Ceram, 4,000 feet, January, 1920, one ♂, and Manusela, 6,000 feet, October-December, 1919, one ♂, two ♀♀.

29. *Eurychoria meloda* sp. nov.

♂, ♀, 39—40 mm.

Closely akin to *oenoptila* Prout (Nov. Zool., xxiii, p. 40), quite similar in structure; equally variable. The published description of that species applicable except as noted.

Head and upperside of thorax much brighter, orange-cinnamon to zinc-orange; antennal shaft largely white ("clavola" in the description of *oenoptila* was a very unfortunate lapse for "scape"); fore wing with costa scarcely so rounded, apex slightly more acute; colouring lighter and brighter, predominantly orange; hind wing with apex slightly squarer, termen a little more convex. Underside paler and yellower, with narrow vinaceous-tinged border.

Habitat.—Gamoe 'Mrapat, three ♂♂, four ♀♀.

Perhaps a race of *oenoptila*. The only aberration, however, in which the purplish or vinaceous colour is dominant has the orange spots differently placed from those of *oenoptila* ab. *variegata*—one in end of cell and one behind it, a large but broken one between C and R³ just proximal to the subterminal, and a small one at the same distance from termen on the fold.

NEW GEOMETRIDAE FROM CENTRAL CERAM.

By LOUIS B. PROUT.

THE following species and subspecies have been worked out subsequently to the publication of the first descriptions of the Geometrid novelties obtained by the Pratts during their expedition of 1919. All the types and allotypes are in the Joicey collection.

Subfamily LARENTINAE.

1. *Chaetolopha ornatipennis* Warr. *peregrina* subsp. nov.

♂, 20—22 mm.

Larger than *o. ornatipennis* Warr. (1906), the fore wing and (especially in the distal half) the hind wing with a much more ochreous hue, the white bands of the fore wing more strongly and broadly shaded with yellow. Underside still more strongly and brightly ochreous.

Habitat.—Manusela, 6,000 feet, October-December, 1919, type and 4 paratypes; 4,600 feet, January 1920, one ♂.

I refer this group to *Chaetolopha*, though the hair-tuft on vein M² of hind wing beneath is wanting. The species are characterized by the long palpus, with heavily clothed second joint and long, exposed terminal joint, the slender abdomen, very large areole, angulated discocellulars of the hind wing, &c.

2. *Chloroclystis filicata* Swinh. *manusela* subsp. nov.

♀, 29—30 mm.

Larger than *f. filicata* Swinh. (1892) from the Khasis, much greener both above and beneath, above greenish glaucous-blue (Ridgway, pl. xlii),—really a mixture of a greener and a bluer shade—beneath more of a pistachio green (Ridgway, pl. xli), underside with postmedian line less thick.

Habitat.—Manusela, October-December 1919, two ♀ ♀.

Perhaps a separate species, but pending the discovery of the ♂ I refer it here.

3. *Chloroclystis (Rhinoprora) viridata* Warr. *solidifascia*, subsp. nov.

♀.

Fore wing with central fascia rather broader than in *v. viridata*, Warr. (1895), much more brown-mixed, presenting 'the appearance, to the naked eye, of a solid dark area with only a slight green admixture in the middle; subterminal line not so straight and continuous between R^2 and M^1 as in that race.

Hind wing and underside more strongly marked than in the name-typical form, the postmedian of the hind wing rather more angled.

Habitat.—Manusela, 6,000 feet, October-December, 1919, two ♀ ♀.

This also is possibly a species. A worn ♂ from Mount Goliath, Central Dutch New Guinea, is in the Tring Museum.

4. *Chloroclystis (Rhinoprora) variospila* Warr. *automola* subsp. nov.

♀, 18—19 mm.

Larger than *v. variospila* Warr. (1895), from Perak, the hind wing and underside more strongly marked, especially as regards dark band which accompanies the subterminal proximally; fringes more strongly spotted.

Habitat.—Manusela, 6,000 feet, October-December, 1919, two ♀ ♀.

Probably as variable as Warren's form. The specimen which I have chosen as type corresponds closely to Warren's ♀ allotype, the central area, excepting proximally to the cell-dot, being broadly greenish-white from R^1 to hindmargin, but the proximal part of this area is rufescent-lined rather than dark-brown or fuscous. In the specimen which I label "ab." the broad median band is almost uniformly dark-brown, as in the Perak ♀ which Mr. Warren referred to his *regularis*, but which I feel confident is an aberration of *variospila*. It should be added that as he gave no identification as to which of his pair of "*regularis*" was holotype and which allotype, I have had to make selection according to the published details; as the description did not mention any green in distal area (which the ♀ shows) and emphasized the character of the fringe and the *spotted* postmedian line of hind wing beneath, I declare the ♂ to be holotype and transfer the ♀ as above.

5. *Chloroclystis eugerys* sp. nov.

♂, ♀, 19—20 mm.

Very near *xanthocomes*-Prout (*Journ. Bombay Nat. Hist. Soc.*, xxxi, p. 320, as *Rhinoprora*). Larger, relatively rather longer-winged. Face loosely tufted. Abdomen with an ill-defined brown, black-mixed anterior patch. Fore wing brighter green (perhaps malachite-green to rejangreen or even deep-glaucous-green of Ridgway, but rather varied), the markings heavier, rather brighter brown; subbasal line thicker, slightly excurved; veins between postmedian and subterminal lines dotted with white, the white more or less thickened and confluent into a noticeable dash from R^1 to R^3 immediately outside the postmedian.

Hind wing in ♂ still clearer whitish than in *xanthocomes*, without cell-dot, the abdominal-marginal hair-tuft also rather paler, the androconial patch at end of M^2 white, scarcely noticeable; in ♀ with sinuous grey postmedian line, two or three straighter lines proximally and shadowy macular grey subterminal.

Habitat.—Manusela, 6,000 feet, October-December, 1919, three ♂♂, two ♀♀.

It is possible that the genus *Rhinoprora* (embracing *Rhinoprora*, *Gymnodisca* and *Sycosmia* of Warren) should still be kept separate from *Chloroclystis*, but as the character of the long palpus, on which alone I resuscitated it, proves untenable, I have at present no alternative but to follow Hampson in merging it again.

6. *Ziridava xylinaria* Walk. *subaequata* subsp. nov.

♀, 34 mm.

Larger than the name-typical race, at least as large as *x. rubridisca* Hmps. (S. India and Ceylon). Fore wing more greyish (the light vinaceous-cinnamon tone less manifest) than in *x. xylinaria*; cell-mark small but relatively elongate, distinct, not confluent with the dark shade beyond; median grey shade broad but not very strong, darkest in its anterior half, not darkened anteriorly at hind margin, here not so oblique; postmedian line only very feebly outbent behind R^2 ; the small dark spot outside it in cellule 4 not connected with termen by any distinct band.

Hind wing similarly somewhat grey-tinged, the cell-dot rather strong, the postmedian line very little excurved about R^3 — M^1 ; otherwise like the weakly marked examples of the other races, the dark subbasal band being almost entirely obsolete.

Habitat.—Manusela, 6,000 feet, October—December, 1919, the type only.

As this differs more from *X. xylinaria*—at least as regards the postmedian line—than do the Australian and New Guinea forms which at present pass collectively as *X. leptometa* Turn. (1907), it is just possible that it may prove a separate species. Unnamed forms from Bali and Flores, however, somewhat approach it.

7. *Phthonoloba hypelaina* sp. nov.

♀, 44 mm.

Closely similar to the ♀ of *definita* Joicey and Talb., therefore belonging probably also to the section *Hypocometa*. Fore wing rather more uniform green, the dark markings being slightly weaker, particularly the thick line of the postmedian series (the second beyond the cell-spot); the double pale antemedian line (band) and notably the dark lines which bound it proximally very different in form from those of *definita*, being acutely angled outward on M.; outer boundary line of subterminal macular rather than lunulate.

Hind wing lacking the light-drab colour (tinged with ecru-drab), of the allies, the base, costa and postmedian band being pale-olive-buff, the central part and broad terminal band rather light greenish-olive, the terminal band slightly the deeper; a blackish cell-dot.

Underside similarly differentiated by its greyish-olive hue, on the fore wing almost green; cell-mark of hind wing more crescentic than above.

Habitat.—Manusela, 6,000 feet, October—December, 1919, the type only.

8. *Stirophora micans* sp. nov.

♂ ♀, 37—40 mm.

Face green, with lower extremity and a few scales at upper edge bright yellow. Palpus over $1\frac{1}{2}$; base and tip bright yellow, the intervening part mostly deep purple-brown. Crown green. Antenna yellow, the scape marked with black, the first few joints of clavola clear, the rest with dark dot on each joint. Thorax above green, somewhat spotted with yellow, especially on the small posterior crests; beneath bright yellow in front. Abdomen dorsally very ornate, the ground-colour dull purple, mixed with black-brown at hind end of segments, each segment with a broad V-shaped bright-yellow mark; laterally

mainly purple; ventrally mainly yellow; plate at base in ♂ moderate. Fore and mid femora and tibia blackish-purple marked with yellow, tarsi and hind leg largely yellowish, shaded with purple; hind tibia of ♂ without spurs.

Fore wing very glossy serpentine-green; the veins mostly marked alternately with yellow and black, some of the black marks (notably on SM^2 and fold just outside the antemedian, on R^{1-2} and on M^2 to fold outside the postmedian) thickened and strengthened; cell-spot large, black; lines yellow; subbasal slightly curved; a thin interrupted line between this and antemedian; antemedian broad, straightest from nearly two-fifths costa to middle of SM^2 , slightly interrupted; median represented by a small costal streak proximal to cell-spot; postmedian rather broad, slightly interrupted, gently sinuate inward behind SC^2 , a little prominent in cellule 5, again gently incurved between this and hinder margin; subterminal indicated anteriorly by enlargement of the vein dots, posteriorly more continuous; termen spotted with black at the veins, yellow between; fringe the reverse.

Hind wing cream colour to Naples yellow, marked with deep plumbago-grey; basal part vaguely suffused; cell-mark long, slightly crescentic; a rather broad, crenulate postmedian line; a weaker subterminal and rather indefinite terminal; fringe predominantly plumbago-grey.

Fore wing beneath purplish-grey, marked with yellow much as above. Hind wing much as above, but with the markings darker and duller.

Habitat.—Manusela, October—December, 1919, four ♂♂, two ♀♀.

9. *Sauris preptochaetes* sp. nov.

♂, 38—42 mm.

Head green; palpi 3; second joint rather heavily scaled; third joint elongate, somewhat fusiform. Antenna light brown, above more or less dark-mixed; appreciably thickened before the tapering apex; a single, very slight concavity on upperside towards two-fifths. Thorax above and upperside of forecoxa green; body and legs otherwise greyish, the abdomen above slightly mixed with greenish and with a small blackish belt at base. Hind femur fringed; a tuft of short black hair from femoro-tibial joint.

Fore wing broad, costa arched except in middle, termen long, curved, moderately oblique, tornus moderately rounded, with no excision

before it, the specialization being here confined to a slight contortion of SM^2 , with a very small patch of dark hair in front and some curled lighter hair at end; yellowish-citrine to olive-lake; costa interruptedly dark, at least to end of median area; dark markings slate-grey; fading off at termen to pallid neutral grey; basal patch moderate, remaining green in front of SC, bounded by an irregularly curved pale line; an indistinct curved white antemedian line; median band narrow, dentate-edged, not entering the cell, obsolete behind the fold and somewhat cut by the ground colour in front of SC; cell-mark absorbed in a proximal indentation of this band; white line distally to the band, thickening at hind margin; subterminal line white, crenate, narrowly dark-edged proximally from R^1 hindwards, distally dark-edged from SC^6 hindwards.

Hind wing small, contorted, pale purplish-grey; costa heavily fringed below, abdominal margin fringed, except at base, with long, longitudinally laid, deep-black hair; cell very short, C well removed from it, SC^2 connected with C by a slight bar considerably beyond cell, then curving backward to diverge widely, R^1 (or R^2 ?) wanting, the only anterior radial arising far behind apex of cell, curving parallel with SC^2 ; abdominal area greatly reduced, with a small lobe at base, the single median vein oblique inward little beyond the lobe.

Underside browner (between clay-colour and isabella-colour); markings of upperside faintly indicated; hind wing with coarse specialized grey scaling in cell.

♀ with R^3-M^1 of hind wing well or longish stalked; coloration and markings above as in the ♂; underside more or less closely as hind wing above (glossy purplish-grey tone prevailing).

Habitat.—Manusela 6,000 feet, October to December, 1919, five ♂♂, five ♀♀. Will form a new section of this endlessly varied genus.

Subfamily GEOMETRINAE.

10. *Peratophyga oblectata* sp. nov.

♂ ♀, 28—30 mm.

Close to *xanthryala* Hmps. (*Faun. Ind. Moths*, iv. p. 553, as *Zamarada*), perhaps a race. Abdomen with the pale dorsal spots less confluent. Fore wing in the single ♂ with the "vinous" maculation of hindmargin more restricted (perhaps merely an ab.); distal border duller, the sinus about R^3-M^2 rather deeper. Hind wing with the angle

at R^3 rather stronger than in *xanthyla*; borders duller than in *xanthyla*, in the ♀ broad, the ground-colour between R^3 and M^2 projecting less deeply than in that species.

Habitat.—Central Ceram, 4,600 feet, January 1920, type ♂ and allotype and paratype ♀; 3,000 feet, November, 1919, one ♀; Manusela 6,000 feet, October to December, 1919, one ♀.

Hampson placed his *xanthyla* in *Zamarada* evidently on account of the coloration, without looking at the structure; R^1 and R^2 of the fore wing are well stalked and only the ♂ has the antenna pectinate, i.e., it is an extreme development of the *trigonata* section of *Peratophyga*; in either genus it would be aberrant in the bent termen of hind wing, not mentioned by Hampson.

11. *Chiasmia seriepunctata* sp. nov.

♂ 25—27 mm.

Face and palpus cream-coloured, with hardly any dark maculation. Vertex slightly paler. Antennal ciliation very long and fine. Thorax and abdomen cream-colour, with fuscous irroration, dorsally forming large but rather ill-defined spots. Legs partly infuscated, the ends of the joints pale; hind tibia not dilated.

Fore wing with termen smooth, scarcely curved; cream-colour with the markings fuscous; cell-spot large, roundish; an elongate spot at base of costa, slightly confluent with one in base of cell; a subbasal spot behind M ; lines represented by large or moderate vein-spots, approximately parallel with termen; antemedian starting from a large vertical, or slightly outwardly oblique costal spot which enters cell; median represented by a generally rather smaller costal spot (rather more distal than cell-spot) and some large posterior spots which are confluent with one another and (anteriorly) with the postmedian and even sometimes with the antemedian; postmedian with the costal spot crossing SC^6 , most of the others slightly elongate longitudinally, those on R^2 and M^2 displaced proximally; subterminal series complete, interneural, the costal and subcostal confluent, slightly proximal, the two radial large, confluent, those behind M^2 confluent, the middle one enlarged; terminal dots interneural, large, irregular, partly confluent, leaving cellules 7 and 3 almost or quite clear, fringe sharply chequered.

Hind wing with spot at base; a moderate cell-spot; median obsolete anteriorly, straightish and confluent from cell-spot (or just proximally) to hindmargin; postmedian vein-spots rather smaller than on fore wing,

not much enlarged posteriorly; subterminal forming a roundish spot between the radials, confluent behind M^2 , smaller spots or dots in the other cellules; termen and fringe much as on fore wing.

Underside similar, slightly less sharply marked.

Habitat.—Manusela, 6,000 feet, four ♂♂.

Nearer to *minuta* Warr.

12. *Scardamia klossi* Rothsch. *protocyma* subsp. nov.

♂, 29—30 mm; ♀, 32—36 mm.

A rather deeply coloured form, but apparently only differing constantly from *klossi klossi* Rothsch. (*Lep. Br. Orn. Un. Exped.*, p. 91) in the form of the antemedian line of the fore wing, which in the New Guinea race is straight or only very faintly undulate, while in that from Ceram it is strongly outbent about M, incurved behind.

Habitat.—Manusela, 6,000 feet, October to December, 1919, two ♂♂, nine ♀♀.

13. *Racotis longidens* sp. nov.

♂, 57 mm.

Close to *inconclusa* Walk., *List. Lep. Ins.*, xxi, p. 382 (1860), from India. Antennal teeth much more strongly developed, being quite conspicuous on the inner side of the shaft (where in *inconclusa* they are vestigial) on the outer side, from about the 10th joint about as long as the diameter of the shaft, from about the 15th to the 25th decidedly longer. Abdominal spine rudimentary (non-functional?). Hind tibiae not dilated, apparently without pencil (one hind leg lost, the other in an unsuitable position for full examination).

Wings with a more olivaceous admixture than in typical *inconclusa*, nearly "isabella colour" of Ridgway; markings exactly as in that species, but much more blurred, with no black scales.

Underside with the distal bands narrower than in *inconclusa*, separated from the termen by a broader pale area.

Habitat.—Manusela, 6,000 feet, October to December, 1919, the type only.

14. *Cleora meceoscia* sp. nov.

♂, ♀, 47—50 mm.

Much larger than *subbarbara* Prout (*supra*, p. 37. Buru and Central Ceram). Antenna of ♂ pectinate to two-thirds, the branches longer.

Hind tibia of ♂ less strongly dilated, with terminal spurs moderate; hind tarsus much less abbreviated three-quarters hind tibia).

Fore wing with termen appreciably more oblique than in *subbarbara*; veins less orange; a black subbasal line present (sometimes interrupted), in the ♂ succeeded by a pale or white line, and this again by a second black line or a narrow dark band; antemedian line strongly oblique inward posteriorly; cell-mark very distinct, almost linear, set on a longitudinal blackish shade about 5 mm. in length, which tapers proximally and distally.

Hind wing and underside even more feebly marked than in *subbarbara*, except that the cell-spot beneath is blackish, that of the fore wing long-oval as above.

Habitat.—Manusela, 6,000 feet, October to December, 1919, three ♂♂, five ♀♀.

The three ♂♂ are of a browner tone than *subbarbara*, perhaps between Mikado-brown and Verona-brown, but strigulated with blackish, and comparatively uniform, the ♀♀ more variable and variegated.

15. *Cleora nigriscripta* Warr. *plenimedia* subsp. nov.

♂ ♀, 36—40 mm.

Generally larger than *n. gavisata* Prout (*supra* p. 38) from Buru, the hind wing similar or with a slightly more creamy tinge, the irroration rather strong near to termen, a postmedian line well developed on underside, at least anteriorly, generally also recognizable anteriorly on upperside.

Fore wing with the median area much widened, at costa measuring 7—9 mm., in the ♂ always solid, in the ♀ moderately so; the band beyond narrow in the ♂, broader in the ♀; distal area heavily shaded with brown and black, almost concolorous with median area.

Habitat.—Manusela, 6,000 feet, October to December, 1919; eleven ♂♂, two ♀♀, apparently not variable.

**THE IDENTITY OF *PAPILIO MONUSTE* LINNÉ.
(LEP. RHOP. PIERIDAE.)**

Papilio monuste Linné, *Mus. Lud. Utr.*, p. 237 (1764) ("Exteris terris").

The insect is described as follows:—

"*Papilio* D.C. Alis rotundatis integerrimis albis margine fusco.

Habitat in Exteris terris.

Corpus tertiae magnitudinis facie *P. brassicae*.

Caput et Thorax nigricantia.

Antennae nigrae.

Abdomen albidum, apice nigrum.

Pedes 6, pallidi.

Alae supra Primodes albae.

Margo fuscus imprimis apicibus et margine exterioreque, non vero postico.

Posticae albae.

Margo exterior tantum denticulato-fuscus.

Subtus omnes concolores, sed loco fusci coloris tantum cinerascentos ad marginem."

In 1775 Fabricius listed *P. monuste* L., giving a reference to a figure in Kleemann (1761) which represents an American insect. Fabricius gives the habitat as "America," and adds the following to the original description: "Alae posticae subtus flavae." Since this work of Fabricius appeared, subsequent authors, with the exception of Cramer and Huebner, have cited the same insect. It is perhaps significant that Linné did not cite Kleemann (in Rösel). He did give references to these figures of Kleemann in describing other things, e.g., *Pap. ricini*.

In 1870 Kirby casts a doubt as to the identity of the insect and says: "Has this species been satisfactorily determined? The *P. monuste* of authors is an American species."

In 1882 Aurivillius, in his paper on the Linnaean types, mentioned

that the type of *P. monuste* was lost. He fixed as *fig. typicae* the American insect figured by Huebner in *Samml. Ex. Sch.* 1, t. 137, figs. 1, 2. A form of this same insect is figured by Roeber in Seitz' *Macrolep.*, 1908.

A doubt as to the identity of *P. monuste* L. with the American insect was expressed to the author by Mr. H. T. (i. Watkins, who suggested that Linné's insect may be the oriental species known as *cycnis* Hew.

To what kind of butterfly does the Linnaean description apply? It must belong to Linné's "Danai Candidi," a section comprising white species with entire margined wings. As it is placed with other species we know as Pierids, it is most probably one of this family.

The wings are rounded and white with a fuscous border, and the antennae are black. The abdomen is white and is black at the apex (anus). The insect has somewhat the facies of *P. brassicae*.

The apex of the fore wing is fuscous, and there is no mention of any white streaks, which is a feature of the American insect. The border of the hind wing is dentately fuscous, but this may not mean that it has toothed markings as is the case with the American insect.

The underside is entirely concolorous, and the border, instead of being fuscous, is cinerascens.

The characters found in the American insect do not agree with the *monuste* characters given. The antenna has a rufous or yellow club; in *monuste* it is black. The dark border of the fore wing shows some white strigae, but there is no mention of this for *monuste*. The hind wing has a fuscous border which is broken up into teeth, generally a series of triangular spots with their apices inward; in this particular the Linnaean description may or may not apply.

The underside is variable. It may be like the upperside, and with cinerascens strigae on the apical area of the fore wing, and with cinerascens teeth on the hind wing, whilst the veins are brownish. The Linnaean description does not mention the strigae, nor any dentate markings on the hind wing. There should be a cinerascens border on the fore wing, but all specimens with a fuscous border on this wing have strongly marked strigae in that area, and when this marginal border is well developed, the hind wing is found to have coincidentally a number of brown markings.

If we assume that the Linnaean description does not fit the American insect in several points, we must look for some other butterfly, preferably one known to the old authors.

In 1777 Cramer figured what he called *monuste* L. He gives the

habitat as China, and a reference to Kleemann's figure, showing that he had never seen this figure. His own figure is of a butterfly which was afterwards described by Hewitson under the name of *cycnis*, and it is found in the Malay Peninsula, Borneo, and Sumatra.

Hewitson's insect has more the facies of *brassicae* than the American one. The fore wing has a fuscous border. The hind wing has fuscous dots on the veins, or has a crenulate border.

On the underside the fore wing has the border mostly cinerascens and the hind wing is unmarked. Antennae black.

It seems to us that the characters of *cycnis* more nearly fit the Linnaean description than the characters afforded by the American insect. It is, however, conceivable that *P. monuste* as described by Linné may apply to either insect. In view of such uncertainty it becomes desirable to know how the name was applied by succeeding authors.

The first definite indication of the identity of *monuste* L. was given by Fabricius (1775), who referred Kleemann's figure to it, and added a short note on the coloration of the hind wing below, giving the habitat as America. Obviously he was writing from what he saw in Kleemann, and did not know the insect himself. There is therefore no question as to what Fabricius meant by his use of the name. He founded it on a figure without any proof that this figure represented the Linnaean insect, and no one can prove that this was not a misidentification. His whole conception of the Linnaean insect was obviously based on the Kleemann figure.

The next definite indication was given by Cramer (1777), as noted already. He figures an insect from a specimen which thus becomes the type of his *monuste*. His reference to Kleemann was apparently copied from Fabricius. As the Cramer figure agrees much better with the Linnaean description than does the figure of Kleemann (note underside), we consider he has proved that the Fabricius determination was erroneous.

Therefore Cramer is to be considered as the first true reviser. So Cramer's insect must be taken as representing *monuste* Linné.

Huebner was apparently not satisfied with the interpretation of the Linnaean description of *monuste*, for in 1820, the insect previously figured by him in the *Sammlung* as *Mancipium monuste* (the American insect), is called *Mylothris hippomonuste*. His *monuste* Linn. becomes the insect figured by Cramer as *lyncida* (a species of *Appias* from Java). We cannot bring ourselves to reconcile *lyncida* with Linné's description.

We cannot understand why Huebner did not accept Cramer's figure of *monuste*; instead he went out of his way to select an insect differing yet more widely from the Linnaean description. There is some mystery here, and as no solution seems possible, we are forced to accept Cramer's figure.

It may be amusing to record Butler's verdict (1869) on Cramer's figure: "Scarcely recognizable"!!! He was perhaps obsessed with the belief that the figures of the earlier authors were mostly fantastic exaggerations. Later research has shown how ill-founded were these ideas.

SYNONYMY.

- 1764—*Papilio monuste* Linn., *Mus. Lud. Ulr.*, p. 237.
1767—*Papilio monuste* Linn., *Syst. Nat.*, ed. xii, p. 760.
1774—*Papilio monuste* Linn., Muller, *Naturs.* v. 1, p. 589.
1777—*Papilio monuste* Linn., Cramer, *Pap. Exot.*, ii, p. 71, pl. cxli, fig. F (China).
1866—*Pieris cygnis* Hew., *Exot. Butts.* 1, *Pieris* vii, fig. 54 (Sumatra).
1867—*Pieris cygnis* Hew., Wallace, *Trans. Ent. Soc. Lond.*, (iii) iv, p. 341.
1871—*Belenois cygnis* Hew., var. Butler, *Trans. Ent. Soc. Lond.*, p. 171, pl. vii, fig. i (Malacca).
1877—*Belenois cygnis* Hew., Butler, *Trans. Linn. Soc. Lond.*, Ser. 2, Zool. vol. i, p. 551.
1885—*Udaina cygnis* Hew., Distant, *Rhop. Malay.*, pp. 286, 300, pl. xxvi, figs. 5 ♂, 6 ♀.

We have treated Cramer as a "first reviser" instead of Fabricius. It may be useful to consider here what is meant by a reviser. To revise the work of others one must: (1) Be in possession of new evidence or make new use of available evidence; (2) make a new appraisal of the facts; (3) demonstrate the new identification.

The mere arbitrary action of quoting any species to represent the conception of an earlier author is not the action of revision, and becomes productive of errors of identification.

In the case of *monuste*, Fabricius produced no new evidence. His use of available evidence was to cite Kleemann without a reason; this was unwarranted, because if this figure of Kleemann represented *monuste*, there is no doubt that Linné himself would have referred to it.

On the other hand, Cramer was in possession of a specimen which he figured, and which he held to agree with Linné's conception of *monuste*.

It is obvious that Cramer is more nearly correct than Fabricius, even though he may actually be wrong in his identification, which however, no one can prove.

Mr. L. B. Prout, a member of the international committee on entomological nomenclature, has considered the argument we have brought forward for *monuste*, and is in agreement with the statements made.

The American insect, known as *monuste* Auct., will stand as *phileta* Fabr. (1775).

NEW MOTHS FROM THE ISLANDS OF ST. THOMAS AND PRINCIPE.

BY G. TALBOT.

(Plate II.)

THESE specimens were all collected by Mr. T. A. Barns, and the types and paratypes of all *Lymantriidae*, *Notodontidae* and *Epiplimidæ* have been presented to the British Museum by Mr. J. J. Joicey.

NOLINAE.

Nola hypenoides sp. nov. (pl. ii, fig. 9).

Allied to *mesoscota* Hmps. (1909) from the Transvaal; the markings of the fore wing are differently shaped.

♂, ♀. Fore wing above with ground-colour deep rufous mixed with grey fuscous and dark-brown. A dark costal shade at the base. A deep-brown and narrow discal band crossing the middle of the cell and expanding on the costa, its inner edge angled below the costa, its outer edge nearly straight and oblique. A dark postdiscal band, much wider than the discal band, from costa to inner margin, angled proximad at vein 5 and touching cell margin at vein 3, and is thence nearly straight to the margin. The inner edge of this band slightly diffuse, but the outer edge is sharply defined by darker rufous-brown followed by grey-fuscous. Distal area slightly paler than area proximad of the outer edge of postdiscal band. A submarginal line, its inner edge deep brown, its outer edge greyish-fuscous, running from just below the apex to the inner margin just beyond the tornus. This line curves proximad above vein 6 to a point midway between postdiscal band and margin, and is then nearly straight to vein 2 where it is slightly angled and directed towards the tornus. Some blackish dots in the cell and on costa. Cilia fuscous-brown marked with black between the veins and with a pale basal line.

Hind wing fuscous-brown.

Underside of fore wing fuscous-brown with blackish suffusion. Before the apex a costal patch of reddish-brown within a dark and indistinct postdiscal line which is straight and becomes less distinct to the submedian. Hind wing ochreous-brown strongly irrorated with fuscous. A curved fuscous postdiscal band and a heavy blackish discoidal bar.

Antennae, head, palpi and pectus fuscous-brown with a rufous tinge. Abdomen fuscous-brown and grey, anal tuft grey. Legs fuscous-brown marked with black.

Length of fore wing: ♂ 11.5 mm., ♀ 13.5 mm.

Habitat.—St. Thomas, January 24—February 25, 1926, two ♂♂, two ♀♀, taken by T. A. Barns. The ♀ is taken as the holotype because one ♂ has a damaged abdomen and hind wing, and the other is much rubbed.

HYPsiDAE.

Deilemera insularis sp. nov.

Allied to *arieticornis* Strand (*Ann. Soc. Ent. Belg.*, 53, p. 346). The antennae have longer pectinations, the wings are shorter, and the band of the fore wing is much narrower.

♂. Fore wing above fuscous-brown, paler in the basal and submedian area, and slightly dusted with yellowish in the apical area. Discal hyaline band not well defined and strongly dusted with fuscous-brown, from 5–6 mm. broad in cellule 2. A vestige of the white band seen in such species as *apicalis* Walk. occurs as an oblong yellowish-white costal spot. The veins and cilia black-brown, the cilia white between the submedian and vein 2, and between veins 5 and 7.

Hind wing white with a fuscous-brown outer border, which is about 6 mm. wide on vein 4 and narrows to the anal angle; the edge of this border is not well defined. Veins strongly dark brown from the margin to before the cell within the white area, as in *arieticornis*.

Underside with paler brown colouring. Fore wing with the basal area to vein 2 and proximal two-thirds of inner margin grey-white but lightly scaled.

Antennae black with long pinnae. Head fuscous-brown; tuft on the vertex mixed with yellowish-white, frons edged with yellowish-white. Collar orange. Palpi with the basal segment, posterior half of middle segment orange, the rest deep brown. Patagia and tegulae deep brown

edged with yellowish white. Pectus fuscous-brown mixed with grey-white. Legs fuscous-brown marked with stone-grey, the fore femora orange on the inside. Abdomen pale fuscous brown above, apices of segments narrowly grey-brown; ventral surface orange except the three basal segments which are stone-grey. A subventral row of black dots and a lateral orange line.

♀. Paler in colour than the ♂. Band of fore wing less darkened and the costal spot larger. Antennae with longer serrations than in *apicalis* Walk.

Length of fore wing: ♂, ♀, 25—27 mm.

Habitat.—St. Thomas, January 10—January 24, 1926, three ♂ ♂ (holotype); September—October, 1926, one ♂; January 24—February 25, 1926; two ♀ ♀ (allotype).

LYMANTRIIDAE.

Heptaptosis gen. nov. (text fig. 1).

Allied to *Dasychira*, but the position of veins 6 and 7 of the fore wing are distinctive.

Neuration.—Fore wing with vein 2 about $\frac{3}{8}$ from base, 3 from well before the angle, 4 from the angle, 5 from just above the angle, 6 and 7 close together from the middle of an accessory cell, 8 and 9 forked near the apex, their stalk from the end of the accessory cell, 10 from the accessory cell, 11 from the cell. On the underside a stripe of raised scales in the basal part of the cell along its upper edge. Hind wing with vein 2 at about $\frac{2}{3}$ from the base, 3 and 4 from the same point at the angle, 5 from just above the angle, 6 and 7 shortly stalked.

Antennae not quite $\frac{1}{2}$ length of costa, with long pectinations.

Palpi porrect, reaching beyond the frons, third segment very short, shorter than the first.

Legs.—Fore tibia with the blade as long as the tibia, and for more than half its length as broad as the tibia, narrowed anteriorly and rounded at the end. Hind tibia with a single median spur, and a single terminal one which is a little shorter, the terminal spur only is strongly chitinized and pointed at its end. Mid tibia with a single terminal spur shorter than the one on the hind tibia.

Genitalia.—Uncus with two prongs forming a U shape, the lobes being curved inwards. Valve long and narrow, edges inflexed. The dorsal edge is furnished with a strongly thickened rib which is well curved inwards for its posterior two-thirds, prolonged inwards to a

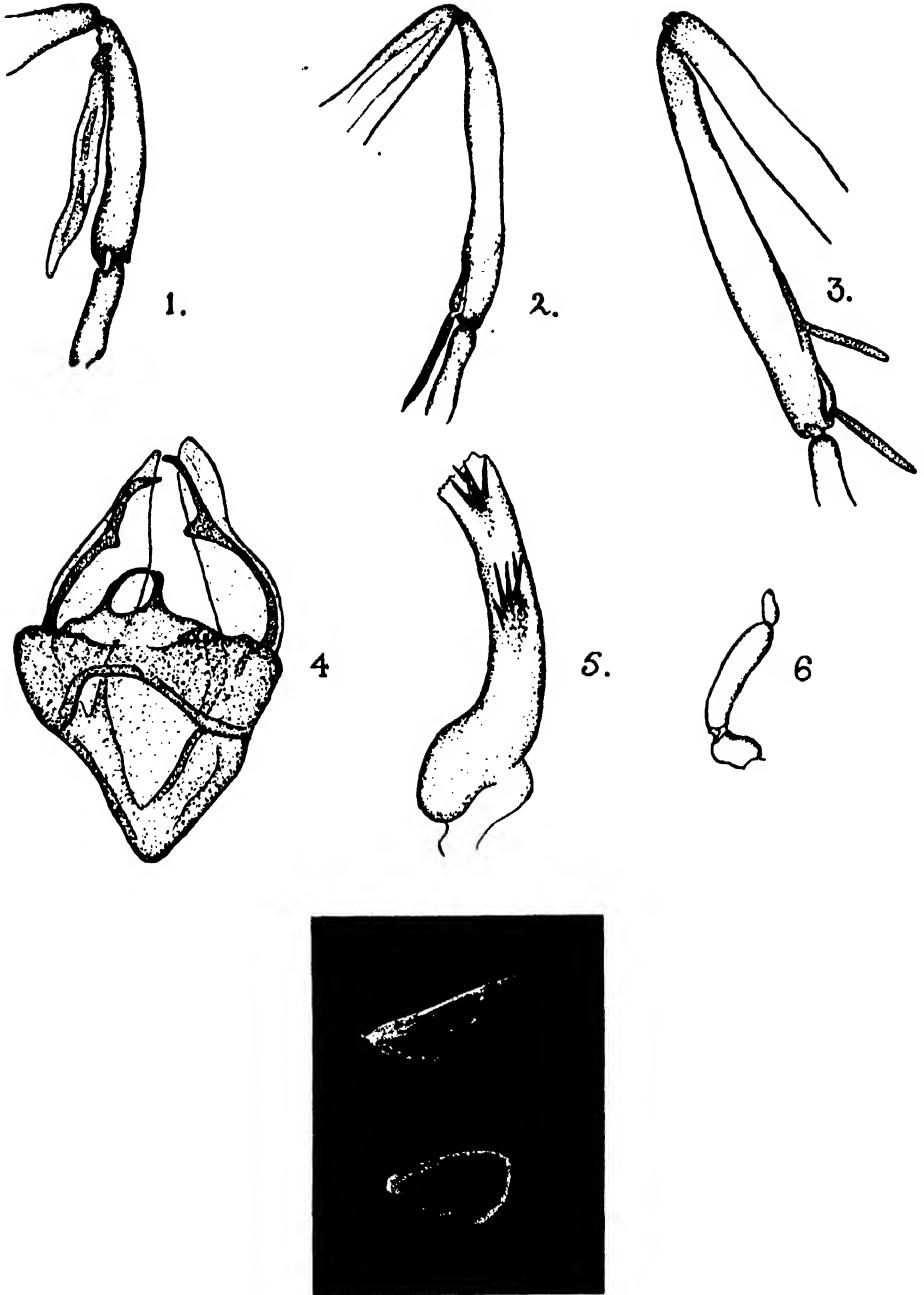


FIG. 1.—*Heptaptosis joiceyi*.

A. 1, fore-leg; 2, mid-leg; 3, hind-leg; 4, genitalia; 5, penis; 6, palpus.
 From drawings made by N. Bennett.

B. Neuration of fore and hind wing. From direct prints obtained of cleared wings on P.O.P.

short lobe, then anteriorly gently curved and narrowed, its end becoming free from the apex of the valve membrane, expanded and rounded at the end. Saccus broad and triangular. Penis broad and of moderate length, armed with two clusters of cornuti, one near the apex and one near the middle on the same side; these spines are long and narrow. We cannot say to what extent the genitalia structure is characteristic of the genus.

Type *joiceyi* sp. nov. ♂.

Heptaptosis joiceyi sp. nov. (pl. ii, fig. 7).

♂. Fore wing with ground colour pale buff irrorated with ochraceous and black-brown. Veins striped with black. An indistinct broad sub-basal black band from the upper edge of cell to the inner margin, and forming a right angle on the submedian fold. A similarly angled black discal line crossing the cell before vein 2, accentuated by a costal spot and angled also on the upper edge of the cell. Discocellulars and accessory cell outlined with black. A postdiscal blackish-brown line from the costa to inner margin, excurved anteriorly, slightly incurved below vein 4 and excurved below the submedian fold; its outer edge is bordered with creamy-white. On the inner margin between the discal and postdiscal lines some blackish scaling. Distal area with cloudy yellowish-brown patches between the veins, darker in cellule 6.

Hind wing creamy-white, veins 2—6 black, 1 a, 1 b, and 7 black distally.

Underside ground-colour cream. Fore wing with heavy black post-discal line reaching only the submedian fold and incurved below vein 4. A heavy lunulate discoidal spot. In cellules 5 and 6 some black distal dusting. Veins black distally. Cilia black on the outer half, inner half of the ground-colour. Costa finely black. Hind wing with a black postdiscal line from near the apex to the submedian fold, becoming less distinct below vein 5, slightly excurved and directed towards the inner margin. A black mark on the upper discocellulars.

Antennal shaft black, pinnae yellowish-brown. Head buff-yellow mixed with orange. Palpi mostly blackish-brown, but partly cream-colour on the inside and below. Legs black, marked with fuscous, hair fringes cream. Thorax and abdomen cream with slight tinge of yellow-brown.

Length of fore wing, 24 mm.

Habitat.—Isle of Principe, 3,300 feet, April—May, 1926, a series of ♂ ♂. Only seen on the summit of the main peak.

Dasychira thomensis sp. nov. (pl. ii, figs. 13 ♂, 15 ♀).

A distinct species, the ♂ somewhat resembling *carpenteri* B.—Bkr., as figured in Seitz' *Macrolep.* xiv, pl. 25a. The sexes are markedly dissimilar.

♂. Fore wing pale yellow with reddish-brown markings. All transverse lines are accentuated on the costa and are weaker towards the inner margin. Some basal dark dusting followed by an irregular sub-basal line emphasized by a sharply defined dot just below base of cell. A second subbasal line double and strongly curved crossing the cell near its base. A discal line, crossing cell at vein 2, angled in the cell and again below it, thence nearly straight to the margin. A dark dot behind vein 2 and another one proximal of it, above which is a dark diffuse bar in the cell. Discocellulars outlined on each side forming a lunulate discoidal mark. A postdiscal strongly dentate line, almost at right angles to the costa to vein 4, then oblique to the submedian from which it makes a slight curve to the margin; this line is followed closely by traces of a heavier and non-dentate line. Beyond this are traces of another and double dentate line which is broken up, but which forms below vein 2 a submarginal somewhat rounded spot with a dark centre and two dots on its outer edge. A submarginal row of dots between the veins. The basal area and the distal area between the postdiscal line and the margin more white. Hind wing yellowish-white, more yellow over the inner area.

Underside creamy-white with a yellowish tinge and without markings.

Antennae with the shaft grey-white, pinnae reddish-brown. Palpi ochre-yellow marked with deep brown proximally on the outer side. Head and thorax grey-white (hoary). Abdomen without apparent dorsal tufts, yellowish-brown clothed with white hair at the base, white on the ventral surface, and with a white anal tuft. Legs white, the tibiae and tarsi marked with reddish-brown.

♀. Fore wing grey-white strongly irrorated with fuscous and marked with blackish-brown. Markings similar to the ♂. The double subbasal line is connected with the discal line at vein 2, and proximally below the cell forms a circular mark with the first subbasal line. Discoidal mark strongly defined with a shade reaching the costa. Postdiscal line as in the ♂ followed by a shaded line slightly dentate, and thus forming a band which is well defined. Submarginal dots large and strongly marked. Hind wing fuscous brown, paler in the discal area, and with greyish-white cilia.

Underside fuscous-brown. Fore wing with an obscure discoidal spot. Both wings paler in proximal area. Costa of hind wing fringed with grey-white hair. On fore wing in basal area below the cell is a patch of blackish-brown hair.

Abdomen grey, brown basally. Other details as in the ♂, but the hair of pectus and legs more grey.

Length of fore wing: ♂ 20 mm., ♀ 24 mm.

Habitat.—St. Thomas, January 24—February 25, 1926, one ♂; January 10—January 24, 1926, one ♀.

Crorema quadristrigata sp. nov. (pl. ii, fig. 14).

A distinct species, unlike others known in this genus.

♂. Wings thinly scaled, white tinged with yellow. Fore wing with two thin and indistinct black stripes in the cell, and two more heavily marked ones below the cell, all below one another, the two lower ones more proximal than the others. Veins in the distal area slightly marked with black. Costa and inner margin more yellow. Hind wing without markings.

Antennae fuscous-brown, the shaft grey-white. Head and palpi grey-white tinged with brown; thorax and legs yellowish-brown; abdomen yellowish-brown mixed slightly with white.

♀. The black stripes on the fore wing much broader and more distinct, and the veins are more strongly dusted with blackish-brown.

Length of fore wing, ♂ 17 mm., ♀ 21 mm.

Habitat.—St. Thomas, January 24—February 25, 1926, two ♂♂, three ♀♀.

NOTODONTIDAE.

Cerura thomensis sp. nov. (pl. ii, fig. 16).

Allied to *marshalli* Hmps. (1910) but differs in the fore wing distal markings.

♂. White. Fore wing with vein 10 fused with 9 and arising just beyond 7. Some slight black scaling at and near base followed by an irregular subbasal line from costa to inner margin, broken by the submedian. A black distal band from costa to inner margin, crossing the proximal part of cell and angled inwards below the cell. A discal waved black line from costa to inner margin, crossing the cell before vein 2. A postdiscal black line from costa to inner margin, strongly accentuated on the costa, entering the end of the cell and forming a

curve which is directed across the base from vein 4 anteriorly to vein 6 where it curves downwards to vein 3 and is then strongly crenulate to the inner margin near the discal line; anteriorly this line sometimes encloses an oval area by a further prolongation to the costa, and within this area is a black line on the discocellulars; posteriorly it has a short branch from vein 2 to the inner margin. A triangular black costal spot above the outer curve of the postdiscal line. A second and less distinct postdiscal line arises from a small costal spot, is gently crenulate, and from vein 6 runs nearly parallel to the first line. An irregular submarginal line, curving inwards between veins 3 and 6 and becoming indistinct to the inner margin. A series of black cilia dots between the veins.

Hind wing with a series of black cilia dots between the veins; in 1c there is a pair of dots, and in 1b the dot is close to the veins. A black discocellular bar.

Underside of fore wing with black costal spot at the retinaculum and another a little beyond. Upper edge of cell with distal black scaling which is heavier at upper angle of cell and is continued as a subcostal stripe slightly broken at vein 7 and accentuated on the costa before the apex. A black discocellular bar. Hind wing as above.

Antennae fuscous-brown, basal half of shaft white on upperside. Head and patagia white, frons edged with blackish-brown at sides and below, palpi blackish-brown. Thorax with a black band below patagia, tegulae white with a black spot, centre of thorax with black spots, and a black line near the base. Legs yellowish-white mixed with black, tarsi mostly black. Pectus and abdomen below yellowish-white. Abdomen above black, base covered with yellowish-white hair, anal segments yellowish-white mixed with black.

♀. Upperside markings as in the ♂. Underside of fore wing with five black costal spots and a discocellular bar. A postdiscal fuscous-brown band of scattered scaling from costa to submedian, and a similar but broader submarginal band somewhat diffuse on its outer edge. Hind wing with a slight marginal border of fuscous-brown scaling from the apex to vein 2, and a black discocellular bar.

Antennal shaft white to the tip above. Head, thorax and abdomen without any yellow tinge. Abdomen white also above but with scattered black scales, the third segment black except in the middle.

Length of fore wing, ♂ 24 mm., ♀ 29 mm.

Habitat.—St. Thomas, January 24—February 25, 1926, six ♂♂, one ♀.

Eurystaura fuscata sp. nov. (pl. ii, fig. 11).

The genus *Eurystaura* was described by Janse in *Annals Transvaal Mus.*, vii, pt. iii, p. 216, 1920, from a single species found in Natal. The species we describe from Sao Thome differs in the position of vein 6 of the fore wing which arises close to the upper angle of the cell and is not connected with 10. On the hind wing vein 3 is placed nearer to 4.

♂, ♀. Fore wing above of a deep rufous-brown ground-colour with darker markings. The transverse lines are indicated by dots on the veins and are accentuated on the costa where nine or ten spots may be observed. These costal spots show the position of two indistinct sub-basal lines, a line crossing the basal part of cell and forming a wedge-shaped mark below the cell, a second line crossing the cell at origin of vein 2 and angled outwards at this vein, a third line just beyond the second and crossing the base of cellule 2, three postdiscal lines, the first straight and the others curved slightly outwards at their middle, and a pale wavy submarginal line which is proximally well shaded; a marginal row of dashes on the vein ends. Some indication of a pale stripe along the submedian area and in cellules 4 and 5. The wing is very heavily scaled and the markings are not very distinct.

Hind wing fuscous-brown, more lightly scaled than the fore wing, and slightly darker along the outer margin.

Underside fuscous-brown and darker than the hind wing above. A pale indistinct narrow and straight postdiscal band on both wings, defines on its inner edge a darker proximal half of the wing.

Antennal shaft reddish-brown, piinae fuscous-brown. Head and patagia reddish-brown, palpi much darker. Thorax, abdomen, pectus and legs deep rufous-brown mixed with fuscous-brown.

Length of fore wing, ♂ 18 mm., ♀ 20 mm.

Habitat.—St. Thomas, January 24—February 25, 1926, three ♂♂, one ♀ (holotype); January 10—January 24, 1926, eight ♂♂, one ♀ (allotype).

EPIPLEMIDAE.

Epiptema scripta sp. nov. (pl. ii, fig. 6).

White with fuscous-brown markings. Discal and postdiscal lines angulate and distinct, on the fore wing a bar connects them in cellule 4.

♀. Ground-colour chalky-white irrorated with fuscous-brown and with markings of the same colour. Fore wing with a black basal dot. A discal line, anteriorly from before middle of costa to the end of cell, posteriorly directed inwards across base of vein 3 and of cellule 2 and

reaching the margin. Postdiscal line heavier, angled three times below the costa to vein 6 from which it runs inwards to cellule 4, where a bar connects it to the discal line, is angled outwards to vein 4 and is thence oblique to the inner margin, being angled twice from the submedian. The two lines give the appearance of a band which is constricted near the middle and widely expanded above this. A small dark costal patch before the apex, a larger and more nebulous patch at the margin in cellule 4, an indistinct patch near the tornus and two blackish-brown submarginal dots in 6 and 7. A marginal line from before the apex.

Hind wing with a subbasal dot on lower edge of cell, and a dot at the point of origin of veins 6 and 7. A subbasal line angled at the middle. A postdiscal line strongly angled, accentuated at the costa beyond the middle, excurved to below vein 6 where it is sharply angled and runs distad to vein 4, thence bent inwards and joining the subbasal line at the inner margin. Some distal fuscous irroration forming several interrupted lines. A marginal line interrupted at the veins. Cilia of both wings fuscous-brown marked with white.

Underside chalky-white. Costa of fore wing blackish-brown for the proximal half, and a similarly-coloured spot beyond its middle. Two black submarginal dots in 6 and 7, and a small spot at the base of cellule 5. Hind wing with a small spot at base of veins 6 and 7, and a submarginal dot in cellule 6.

Antennae white above, below yellowish-brown. Vertex of head white, frons and palpi blackish-brown. Legs white marked with fuscous-brown. Thorax and basal three segments and ventral surface of abdomen white, rest of abdomen fuscous-brown.

Length of fore wing, 12 mm.

Habitat.—St. Thomas, January 24 to February 25, 1926, one ♀.

Gathynia angulata sp. nov. (pl. ii, fig. 12).

Distinguished by the conspicuous and sharply angulate discal line on the hind wing.

♀. Fore wing ashy-grey strongly irrorated with fuscous-brown and tinged with ochreous distally. The area between the discal and postdiscal lines darker than the rest of the wing. Discal line strongly excurved, accentuated by a dot in the cell and reaching inner margin near the base. Postdiscal line slightly angled below the costa, incurved to vein 4, then excurved. An indistinct submarginal line runs from the costa to a point on the inner margin midway between the postdiscal line and the margin; this line is slightly waved and is straighter than the

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postdiscal one. Two ochreous-brown submarginal dots below the apex. Outer margin with a dark shade from vein 6 to 3.

Hind wing grey-white strongly irrorated with blackish-brown and fuscous, paler in the inner area and in the postdiscal area. A brown spot below the lower angle of cell. A well-defined brown discal line straight from the costa to vein 2 where it forms a V-shaped angle and reaches the inner margin at right angles. This line is bordered by blackish-brown on the inner side, and broadly margined with the pale ground-colour on the distal side, where also anteriorly is a thin edging of blackish-brown not touching the line. A submarginal band formed of three blackish lines which is angled at vein 4 and reaches the anal angle. A black submarginal dot in cellule 3. Apical area broadly deep brown with an ochreous tinge.

Underside of fore wing ashy-grey, paler on the costa and at the apex. Hind wing grey-white irrorated with fuscous-brown and bearing an indistinct discal line.

Antennae yellowish-brown, white at extreme base. Vertex of head white, frons and palpi blackish-brown. Legs fuscous-brown marked with grey. Thorax and abdomen ashy-grey.

Length of fore wing, 15 mm.

Habitat.—St. Thomas, January 24 to February 25, 1926, two ♀♀.

SOME NEW FORMS OF CASTNIIDAE.

By G. TALBOT.

(Plate I).

1. *Castnia (Boisduvalia) securis* sp. nov. (pl. i, fig. 2).

This appears allied to *melessus* Druce (1890), but the stalk of 7 and 8 of the fore wing is much longer. However we should not be surprised if the two forms proved to be only one species. The specific distinctness of these various mimetic forms of *Castnia* has not yet been worked out and larger material is necessary before any certainties can be reached.

♂. The general pattern of *melessus*. Fore wing with the subcostal stripe and discal patch broader, the discal patch very broad and with a stripe presenting much the appearance of an axe; this marking as well as the median stripe is pale ochre-yellow instead of brown. Median stripe rather broad, entering the cell, and prolonged narrowly in cellule 2 but not reaching the submarginal spot, also prolonged slightly above vein 3, and posteriorly joined to the stripe on the inner margin. The stripe on the inner margin reaches the submedian and is invaded by a short black subbasal bar below the submedian. Beyond the cell, between it and the postdiscal spots is a yellowish small rounded nebulous spot. A postdiscal band as in *melessus* but composed of 5 spots, each being placed a little distad of the one above; the lower fifth spot in cellule 4 is much larger than the others, and below it is the vestige of a sixth spot. The three subapical spots are narrower than in *melessus*, more separated, the middle one strongly wedge-shaped, and they are yellowish-white. The six submarginal spots are all free and are yellowish-white.

Hind wing coloured as in *melessus* except that the submarginal spots are yellowish-white, the ones in 2-4 only being tinged with brown. The brown area extended below the cell, but reduced towards the apex. Subcostal black stripe broken at the base of cellule 6 and forming also an ellipse within which is some black dusting. Costal area

broadly yellowish-cream, being much lighter than in *melessus*. Seven free submarginal spots, and an eighth which is joined to a narrow extension of the brown area. In cellules 4 and 5 are two small brown postdiscal spots.

Underside of fore wing as above. Hind wing with the costal area only slightly paler than the rest; postdiscal spots in 1c-5, the one in 3 very small.

Abdomen coloured as in *melessus*, with the bluish-white dorsal line characteristic of this group of *Castnia*.

♂ Size as *melessus* and allied forms.

Habitat.—Manaos, Amazon. A single specimen received from the firm of Staudinger and Bang-Haas.

2. *Castnia (Boisduvalia) pellowia* Druce *coarctifascia* subsp. nov. (pl. i, fig. 3).

♀. Colouring and markings very much as in *pellowia* Druce (1890). Fore wing with the outer edge of the discal band clearly and evenly defined, without any prolongation on veins 3 and 4. No patch in the cell, only the vestige of a spot in the middle. Costa more broadly black near the base. Hind wing with the brown distal markings reduced on the costa and not extended below vein 6, below this vein only a small submarginal spot.

Underside of fore wing with less distal yellow tinge than in the typical form. Hind wing with the brown costal stripe broken near the base and more reduced distally than on the upperside.

A large specimen, the fore wing measuring 53 mm. long, but size is not usually constant in *Castnia*.

Habitat.—Ecuador: Sucua, via Macas, 800 m. A single specimen received from the firm of Staudinger and Bang-Haas.

3. *Castnia daguana* Preiss *fuliginea* subsp. nov. (pl. i, fig. 1).

This species belongs to the group of *Doubledaya* Buchecker (= *Gazera* Houlb. nec Boisduv.). It is probable that *linoides* Strand (1913) is a race of *daguana* Preiss (1899), in which case *dimorpha* Rüb. (1927) and *fuliginea* are dimorphic forms of it. A closely allied form, perhaps even also belonging to the same species, is *halli* J. and T. (1925) from West Ecuador.

The form *dimorpha* is very similar to *linoides* but has the fore wing markings darkened, except the white subapical band of the ♀. The types are in the Hill Museum from West Colombia. The form *fuliginea*

is still darker in the ♀, but the white subapical band still persists. It is a very striking form.

♀. Both wings on both sides sooty-black. Fore wing markings somewhat as in *linoides*. The white subapical band placed more distad and composed of 6 spots separated by the veins, curved distad, narrower at the costa. The white bar beyond the cell is short, narrow, and suffused on its inner edge. A median patch, divided by vein 3, is heavily suffused and a submedian stripe is also indicated. Submarginal white spots as in *linoides*, those in 1c, 2, and 3 are square-shaped.

Hind wing with obscure submarginal spots. No other markings except when viewed obliquely a faint shadow of a discal band, placed as in *dimorpha*, is seen.

Underside as above. The submarginal spots larger. On the hind wing the shadow of a discal band is more obvious.

Abdomen on the ventral surface pale yellow, a feature common to the forms we have mentioned.

Habitat.—Rio Dagua, West Colombia, March, 1928, one ♀ collected by W. Hopp, received from the firm of Staudinger and Bang-Haas.

The form *gephyra* Hering (1923) was based on a single ♀ from West Colombia, and appears to be a form (ab. individ.) of the variable *daguana* Preiss. Another similar form is *leucozona* Hopp (1925) (Rio Micay), with a white subapical band, linking up with *dimorpha*. It appears to us that in West Colombia there exist several forms (not racial) of a single variable species of which *linoides* from Ecuador is a race.

4. *Castnia* (*Doubledaya*) *columbina* Bdv. *panamensis* subsp. nov. (pl. i, fig. 4).

A very rare species of which *carilla* Schaus (1911) from Costa Rica appears to be a race. It has affinities with *daguana* Preiss and *salvina* Westw. Veins 7 and 8 of the fore wing are on a long stalk in these forms, and this is not the case with *zagraea* Feld. nor with *cyena* Westw. It is possible that this position of veins 7 and 8 is a specific character.

♀. Ground-colour of fore wing browner than in *columbina* Bdv. (1874), and all markings ochreous-yellow instead of white. The post-discal spots are similarly placed, but those in 4 and 5 are more elongate, the stripe in 3 is absent and the one below this is shaped as in the typical form but is heavily dusted with ground-colour like the submedian and cell-stripes. The submedian stripe is lengthened distad and so the two spots occurring in the typical form are here absent.

Hind wing duller brown than in the typical form, the outer ends of this area not indented and not clearly defined; there are slight extensions between the veins to the submarginal spots which are ochreous-yellow and prominent, somewhat as in *daguanu*. The black subcostal stripe is well-marked and extends as in the typical form.

Underside similar to the upperside, the obscure fore wing markings clearly defined. Hind wing without the postdiscal spots found in *columbina*. Abdomen as in *columbina*.

Habitat.—Chiriqui, one ♀ received from the firm of Staudinger and Bang-Haas.

NEW FORMS OF AFRICAN LEPIDOPTERA.

BY G. TALBOT.

PAPILIONIDAE.

Papilio philonoe Ward *whalleyi* subsp. nov. (pl. ii, fig. 3).

P. philonoe Ward (1873) occurs in the eastern parts of Kenya and Tanganyika between Mombasa and Dar-es-Salaam. Its occurrence in the South-east Sudan is therefore of much interest. It should be found in Kenya to the west, but does not appear to have been recorded from Mt. Elgon.

♂. Markings mostly reduced. Fore wing without the stripe on the inner margin; cell-stripes separated; submarginal spots more developed than in the typical form; the discal spot in 2 rather small; the stripe in 1b narrow and not reaching the submedian vein. Hind wing with postcellular patches reduced and no spots in the base of cellules 3, 4, 5; submarginal markings more strongly developed than is usual in the typical form.

Underside as above, ground-colour darker and less reddish than in the typical form.

Habitat.—S.E. Sudan: Imatong Mountains and Opare Forest, 8,000—10,000 feet. One ♂ collected by Captain R. C. R. Whalley, to whom we have dedicated this well-marked race; a second ♂, which we have made the type, because it is in better condition, was sent later from the Imatong Mountains without further data.

PIERIDAE.

Teracolus aurigineus Butl. *angolanus* subsp. nov.

♀. Upperside much paler than in *aurigineus* Butl. (1883), and all the marginal spots larger. Fore wing with narrower postcellular stripes above vein 4. Hind wing with the spots of the postdiscal band smaller. Underside paler. Fore wing with the margin black between vein 2 and

the submedian. Hind wing with the brown submarginal line heavily marked.

Habitat.—Angola: Lobito Bay, November, 1928, two ♀♀. Collected by T. A. Barns.

NYMPHALIIDAE.

Euphaedra spatiosa Mab. *sudanensis* subsp. nov.

♂ ♀. Slightly though constantly differentiated from *spatiosa* Mab. (1877) by the markings of the underside. Fore wing with the dark postdiscal band straighter, blacker, narrower (especially posteriorly), and more sharply defined on its inner edge. Hind wing with the postdiscal band blacker and somewhat more sharply defined. The pale costal patch is broader; its inner edge in cellule 7 is more oblique and below vein 7 is indistinct. The cell-dots are minute.

Compared with Uganda and Congo specimens.

Habitat.—S.E. Sudan: Imatong Mountains and Opare Forest, 8,000—10,000 feet; two ♂♂, one ♀. Collected by Captain R. C. R. Whalley.

Euphaedra ceres phosphor. J. and T. ♀.

♂. *Euphaedra ceres* f. *phosphor* Joicey and Talbot, *Bull. Hill Mus.*, 1, p. 66, pl. xii, fig. 33 (1921) (Albertville).

The appearance of the ♀ and the occurrence of specimens from the Mpala district farther south seem indicative that this form constitutes a race.

♀. Fore wing subapical band white, broader than in the ♂. Stripe on the inner margin bluish-white. Hind wing, excepting the dark borders, bluish-white. Underside as in the ♂, the postdiscal white area on hind wing more extended.

Neallotype in the British Museum from Mpala District, West Tanganyika, also ♂♂ from the same place, ex Coll. Oberthür. In Hill Museum a ♂ and ♀ in poor condition, taken by Mr. T. A. Barns at Albertville, January, 1922, in a very dry season; also one ♂ from the Luvua River, 85 miles north of Lake Mweru, April, 1922, end of wet season.

AMATIDAE.

Metarctia titan sp. nov.

Allied to *lateritia* H.-S. (1855) which was obtained in the same locality, but larger than the larger specimens of that species, and with a red marginal line on both wings.

♂. Fore wing with fuscous-brown ground-colour, all the veins and the costal edge crimson. Cilia slightly paler than the ground-colour. A thin red marginal line from apex to submedian. Hind wing pale crimson, the costa edged with fuscous. A subcostal fuscous stripe through the upper part of cell and cellule 5 to the margin.

Underside of fore wing as in *lateritia* but with more distinct marginal line than above. Hind wing as above but with fuscous marginal patches in 2—4, each larger than the other, the smaller in 2.

Antennae black. Palpi with third segment fuscous, the rest fuscous above and red below. Head red except below the vertex which is fuscous. Thorax fuscous mixed with red, pectus red, tibiae and tarsi blackish-brown, femora red. Abdomen orange, red at the base, dorsal black segmental bands, lateral black spots, and an interrupted black ventral line.

Length of the fore wing, 31 mm. (type), 30 mm. (paratype).

Habitat.—South Central Angola: Upper Cubango-Cunene Watershed, 5,500 feet, November, 1928, two ♂♂. Collected by T. A. Barns.

ARCTIIDAE.

Secusio discoidalis sp. nov.

Allied to *strigata* Walk. (1854), and distinguished by the well-defined black margin on the hind wing.

♂ ♀. Fore wing darker brown than in *strigata*. Discal white spots 3 or 4, smaller than in *strigata*, the upper one placed more distad, the lower one smaller than the others. Hind wing ochraceous or reddish-yellow, and with a black distal marginal border from the costa to the anal angle, its inner edge well defined, slightly indented at the veins, and slightly produced on vein 2. Veins more or less darkened, especially the discocellulars.

Underside of fore wing with pale or dark yellow proximal area to beyond the cell and a broad distal marginal border blackish-brown. Spots of the upperside showing through. Hind wing of the same colour as the fore wing with distal border as above, veins less defined.

Antennae black. Palpi with 3rd segment black, 1st and 2nd segments yellow, black on the sides. Head yellow, frons black. Patagia and tegulae yellow-brown marked with black. Legs black marked with grey-white. Abdomen yellow, slightly black on the ventral side.

Length of fore wing.—♂ ♀, 18 mm.

Habitat.—S.E. Angola: Zambesi-Congo Divide, Moxico District, 4,000 feet, October, 1928; four ♂♂, two ♀♀. Collected by T. A. Barns.

Secusio deilemera sp. nov.

If this species had white hind wings it would resemble forms of *Deilemera*, but the hind wing venation is definitely of the *Secusio* type.

♂ ♀. Fore wing blackish-brown, in the ♀ proximally yellowish-brown. Proximal area paler with an indistinct dark band separating it from the discal band. A broad white discal band, mostly a little dusky, traversed by the dark veins and so composed of a spot outside the cell end, two spots in the end of the cell, a spot in cellule 4, a larger one in 3, and a much larger one in 2, a small stripe below vein 2, and a small spot below the submedian fold. Outer edge of this band sharply defined, inner edge not clearly defined. Two pale lines in 1 b and 1 c from the base to beyond the origin of vein 2. Hind wing ochraceous-yellow with a narrow black distal border. Veins black distally.

Underside of fore wing paler, in the ♀ the proximal area ochraceous-yellow.

Antennae black, shaft above narrowly white for basal two-thirds. Palpi black except the 2nd segment anteriorly on the outside and the whole of the 3rd segment which are yellow. Head yellow except the vertex and frons which are black. Tegulae and patagia black edged with grey-white. Legs black, on the inside grey-white. Abdomen above ochraceous-yellow, below grey-white, with lateral and subventral rows of black dots.

Length of fore wing.—♂ ♀, 19-20 mm.

Habitat.—S.E. Angola: Zambesi-Congo Divide, Moxico District, 4,000 feet, October, 1928, one ♂, ten ♀♀. Collected by T. A. Barns.

HYPSIDAE.

Phaegorista xanthosoma Hmps. (1910) f. *nyassae* f. nov.

♂ ♀. Differs from the typical form by the hind wing being coloured ochraceous-yellow on both sides. The patches of the fore wing are more or less tinged with yellow, and on the underside the basal patch is of the same colour as the hind wing.

As we have received no typical examples from Nyasaland it is possible that the yellow form occurs there as a race.

Habitat.—Nyasaland : Zomba, January and February, 1924, one ♂ (holotype) ; Zomba, January, 1922, one ♂, one ♀, December, 1920, one ♂ ; Zomba Plateau, November, 1920, two ♂♂ ; Likomagala River, Zomba District, January, 1922, one ♂ ; Chinteche, one ♂ ; Limbe, January and February, 1928, one ♀ (allotype). All taken by H. Barlow.

ZYGÆNIDÆ.

Arniocera viridifasciata Auriv. (1899) *cyanea* subsp. nov.

♂ ♀.—Upperside with the fore wing markings dark blue, in the ♀ with a slight tinge of green. Subapical band longer, in the ♀ touching the submarginal line.

Underside of both wings dark purplish-blue, stronger in the ♀.

Metallic scaling on the thorax, legs and abdomen dark blue instead of green as in the typical form.

Habitat.—Congo Region : Penghe, Ituri River, May, 1920, one ♂ (holotype). Semliki-Congo Watershed, north-east of Beni, January, 1920, one ♀. Taken by T. A. Barns. The ♂ was taken on dung in a sunny glade at 11 a.m. The ♀ was taken in dense forest, feeding on urine at 12 midday.

Arniocera collenettei sp. nov. (pl. ii, fig. 10).

Allied to *viridifasciata* Auriv. 1899, and distinguished by the long distal stripes on the fore wing, and the steel-blue hind wing. Wings more elongate.

Fore wing above black with dark green markings. A subbasal bar, a broad discal stripe crossing the cell near its base, a second discal stripe crossing the cell before vein 2, a third discal stripe crossing end of cell (not touching cross-veins), its outer edge crossing the base of vein 3. The specimen is abnormal and these stripes are broken on the left wing. Three longitudinal distal stripes ; one subcostal, not reaching the apex, a broader one in cellule 5 reaching the marginal line ; the lower one rather broad and forming a patch between cellule 2 and the submedian, reaching the margin. The outer margin narrowly edged with green scaling. Hind wing steel-blue, cilia black.

Underside glossy steel-blue. Fore wing blackish at the apex and outer margin.

Antennæ black, head metallic green. Palpi porrect with the third segment smoothly scaled, black, second and first segments hairy, red. Pectus and legs black marked with metallic blue and green. Thorax metallic-green. Abdomen lost.

Length of fore wing.—15 mm. Distance from the apex to the outer discal stripe on the inner margin, 9.5 mm.

Habitat.—French Guinea: Massadou, near Macenta, 1,600 feet, 13-17, v. 1926. A single specimen taken by C. L. Collenette in the shade of virgin forest.

I am indebted to Dr. K. Jordan for details respecting this species as distinct from others.

Thermochrous marginata sp. nov.

Allied to *fumicineta* Hamp. (1910), but has narrower black margins and all the veins are darkened.

♂. Reddish-yellow. Fore wing with black distal border, extending on the costa to beyond upper angle of cell, not reaching the cross-veins and narrowing to a point on the submedian, its edge well defined. Veins blackish. Hind wing with a black distal border from the apex to the first submedian, widest at vein 5, its edge well defined. Veins blackish.

Antennae black. Head, thorax and abdomen reddish-yellow. Legs ochraceous.

Length of fore wing, 17 mm.

Habitat.—South Central Angola: Upper Cubango-Cunene Watershed 5,500 feet, October, 1928, two ♂♂, collected by T. A. Barns.

Anomoetes infuscata sp. nov.

♀. Fore wing with the proximal two-thirds reddish-yellow strongly irrorated with blackish. Distal margin broadly black and not clearly defined from the proximal area, entering the upper angle of cell, narrowing below vein 4, and ending in a point on the lower submedian; on the costa it extends to near the middle. Veins blackish. Veins 4 and 5 on a short stalk. Hind wing reddish-yellow with narrow black distal margin from the apex to anal angle, its edge well defined. Veins slightly darkened.

Underside as above. Fore wing proximal area without dark suffusion, and edge of distal area well defined. Hind wing as above.

Antennae black. Head and thorax reddish-yellow. Abdomen reddish-yellow, anal tuft black. Pectus and legs ochraceous.

Length of fore wing.—18 mm.

Habitat.—Angola: South Bihe District, Benguela Plateau, 5,000 feet, November, 1928, one ♀. Collected by T. A. Barns.

This species bears a close resemblance to *T. marginata*, and were it not for the difference in neuration, it may have been considered as the ♀ of that species.

NEW FORMS OF MALAYAN BUTTERFLIES.

By G. TALBOT.

PAPILIONIDAE.

Papilio memnon nestor subsp. nov.

Allied to *clathratus* Roths. (1896), and distinguished in the ♂ by the more strongly marked stripes on the fore wing, and in the ♀ by a submarginal line on the fore wing below, and by the band of the hind wing being dusky.

♂. Fore wing with the grey stripes strongly marked, especially on the underside posteriorly. Hind wing with grey stripes very strongly marked, reaching the margin, and the black intraneural stripes not expanded distally to form spots. The inner edge from this grey distal area is evenly curved and placed farther from the cell than in *clathratus*. Hind wing below with the grey distal markings more accentuated than in the Sumbawa race.

♀. Upperside of fore wing a little paler than in *clathratus*. Hind wing discal band slightly clouded and yellowish, placed nearer the cell, the two anterior spots larger than in *clathratus*. Underside of fore wing paler than in the allied form, and with a submarginal row of grey lunulate marks, more distinct in cellules 2-4. Hind wing discal band more sharply defined and paler than above, the spots in 2 and 3 shortened distally.

Habitat.—Obi, one ♂, one ♀, received from the firm of R. Kruger, in Leipzig.

PIERIDAE.

Delias enniana contracta subsp. nov.

Delias enniana Fruhstorfer, Seitz' *Macrolep.*, ix, p. 128, t. 54a, ♂ ♀ (1910).

♂. Upperside of fore wing with more prominent submarginal spots than in the typical form. Underside of fore wing with narrower white

postcellular bar, especially at vein 4. Hind wing with more prominent submarginal spots and usually with less white distal area and with less evenly curved marginal border.

♀. Upperside of fore wing chalky-white with broader black discocellular bar and narrower white postcellular bar than in the typical form; edge of marginal border more strongly toothed on the veins. Hind wing creamy-white or chalky-white.

Underside with more prominent submarginal spots, and less white area on the hind wing than in the typical form.

This race is chiefly distinguished by the broader discocellular bar on the fore wing; this is almost connected with the black marginal area.

Habitat.—Waigeu. A series of both sexes in the Hill Museum collected in March and May, 1915, by A. C. and F. Pratt.

NYMPHALIDAE.

Euthalia djata Dist. *rubidifascia* subsp. nov. (pl. ii, fig. 2).

♀. White patches of the fore wing smaller than in *djata* or *ludonia*. The dull red discal band of hind wing narrower than in *ludonia*.

Fore wing above with ground-colour as in the typical form, and markings similar. The spot in the base of cellule 4 very small and triangular, the patch in 3 narrower, and the one in 2 reduced a little proximally; the two submedian spots shorter and not touching one another. Hind wing with the ground-colour more brown than in *djata* or *ludonia*. The three anterior red submarginal spots as large as in *ludonia*. The discal band of a dull red is narrower than in the allied forms; its inner edge is farther from the cell, and its outer edge in cellules 4 and 5 is placed farther from the submarginal spots.

Underside as in the allied forms, only differing in the size of the white markings on the fore wing, and in the shape and position of the hind wing discal band.

Habitat.—Sumatra. A single specimen received from Herr H. Kotsch of Dresden.

Euthalia adeona Grose-Smith (1894), of which the type is in the Hill Museum, agrees exactly with a ♀ of *djata* from Sandakan (ex Coll. Elwes, Coll. Pryer). Therefore the name *adeona* will become a synonym of *djata* (1887). In Seitz' *Macrolep.* ix, p. 677, *adeona* is wrongly classed with *lubentina* Crm.

SATYRIDAE.

Elymnias penanga Westw. (1851) ♀ f. *johnsoni* f. nov.

This represents a third form of female for this rare species. It is distinguished by the coloration of the hind wing which bears a large white patch extending from the inner margin to vein 5 and slightly entering the cell. The fore wing is without markings except the trace of a pale stripe in cellule 2. Underside of fore wing with much white distal irroration between vein 4 and the inner margin. Hind wing with white patch as above, but less clearly defined and a little smaller.

Habitat.—Penang, one ♀ taken on the plain by Mr. Trim Johnson, who collected many interesting species of butterflies on Penang and in Perak.

NEW FORMS OF BUTTERFLIES FROM SOUTH AMERICA.

By G. TALBOT.

PAPILIONIDAE.

Papilio erithalion Bdv. (1836) *cantinelae* subsp. nov.

The ♂ of this form is difficult to separate from some specimens of typical *erithalion*, so in the absence of more material we take the ♀ as the type of this race in view of the possibility that we may be dealing only with a female form.

♀. Resembles this sex of *zeuxis* Luc. (1852). On the fore wing the spot in 3 is about the size of the spot above it, but it is proximally narrowed, and does not reach vein 3. The cell-spot is large and does not reach the cross-veins, its inner edge is not indented. Hind wing with a broad discal band as in *zeuxis* but less strongly indented; it enters the cell very slightly, and there is no posterior white suffusion.

♂. Resembles typical *erithalion* Bdv. The green patch reaches vein 3 and is somewhat rounded, touches the cell between veins 2 and 3, and is distally shortened below the submedian. Hind wing with the three spots forming a patch, the veins between them scaled with red and the spots sparsely dotted with black scales.

Underside of fore wing with traces of grey scaling in cellule 3, showing close affinity with the typical form. Hind wing spots slightly separated distally, pink in the proximal half; a fourth spot below vein 2.

Habitat.—South Colombia; *Cantanela*, Putumayo, one ♂, one ♀.

PIERIDAE.

Dismorphia orise Bdv. *interposita* subsp. nov.

♂. A slightly differentiated race. The rounded hyaline apical area of fore wing cut off by vein 5, and only just reaching below the vein at its outer edge. Its inner edge straighter and therefore the black bar,

separating it from the costal hyaline area, is broader. The spot in 3 is narrower than in most specimens of the Peruvian race.

♀. The hyaline apical area of fore wing is narrower than in the Peruvian race, and almost ovate; it extends below vein 5 to a less extent than in other females.

Habitat.—Colombia: Holotype from Muzo, also two ♂♂ from Villavicencia, and one ♀ from Bogota, 1,000 m.

MORPHIDAE.

Morpho rhetenor helena Stgr. (1890), ♀ (pl. i, fig. 5).

♂, *Ent. Nachr.*, xvi, p. 107 (1890) (N. Peru).

♀, Fruhstorfer, Seitz' *Macrolep.*, v, p. 351, 1913, Tarapoto (= *chrysidis* Fruh.).

The description of the female given by Fruhstorfer (*loc. cit.*) is incomplete and was based on a drawing received from the collector, Michael, who discovered the insect at Tarapoto. If this specimen still exists it must be regarded as the allotype of *chrysidis* Fruh., *ib.*, p. 355.

We have received a female from the firm of Staudinger and Bang-Haas, which was collected at Juanjui on the Upper Huallaga.

This specimen bears no close resemblance to the figure of *cusebes* Fruh. in *Stgr. Exot. Butt.*, pl. 70, but is more like the female of *cacica* Stgr. from south and central Peru, with which insect we compare it.

The submarginal and distal markings on both wings are smaller and the distal blackish-brown borders are broader. The outer edge of the brown discal area on the fore wing is more strongly toothed on veins 2—4; in *cusebes* this edge is only slightly indented. The spot of ground-colour at the base of cellule 3 is smaller than in either of the two allies.

The underside has the same coloration as in *cacica*. Fore wing with a discal ocellus in 4 placed more proximad. White cell-bar short and broad, not curved, its outer edge incurved, its inner edge slightly so. Hind wing with weak submarginal markings.

Morpho didius Hopff. f. *incompta* forma nov.

This represents a variation of the underside in which the ocelli are absent.

♂. Ground-colour dark rufous-brown without any greenish colour. Ocelli absent with the exception of a rudimentary one in cellule 2 of the hind wing. On the hind wing the dark submarginal line which

limits the whitish submarginal border is straighter and proximally of it there is only some slight whitish dusting. The margin of the hind wing is less crenulate than usual, has a stronger projection at vein 4 and is marked with reddish-brown between the veins.

Habitat.—Oxobamba, Peru. One ♂ received from the firm of Wernicke (H. Kotsch). Mr. Kotsch informed us that ten similar specimens were obtained.

ERYCINIDÆ.

Mesosemia flavofasciata sp. nov.

The ♀ here described may belong to a known ♂, may be a dimorphic form, or be the race of a known species. It appears to be allied to *mevania* Hew. (1857).

♀. Fore wing with a very broad (7 mm. on vein 4) ochraceous-yellow band. The blue proximal area and the blue area of hind wing are of the shade of colour found in *mevania*. The heavy black line which surrounds the ocellus on the fore wing is outwardly continued to the submedian, and proximally reaches only to the origin of vein 2. Hind wing shaped as in *mevania*, the black border narrower than is usual in females of that species. At the apex the black border is twice as broad as between the costa and vein 6.

Underside with the yellow band as above. Ground-colour darker than in *mevania*, but the other markings are so similar with regard to the variations existing in that species that we find no real difference. The pale postdiscal line on the hind wing is formed of yellow instead of white scales.

Length of fore wing, 22 mm.

Habitat.—South Colombia: Putumayo. One ♀ (type) received from the firm of R. Kruger in Leipzig. Also one ♀ in very poor condition which has been in the Hill Museum for many years, collected by G. Palmer at Quebrada de la Saraga, Rio Tamana, 800 feet.

Emesis glaucescens sp. nov. (pl. ii, fig. 1).

Apparently allied to *lucinda* Cram. with something of the upperside appearance of *lucinda aurinna* Bdv. (1870). The underside differs from all allied forms by the row of submarginal white dots on the fore wing.

♂. Ground-colour very deep green. Fore wing above with large bluish-grey apical area, marked with some indistinct white subapical spots and by still less distinct submarginal dots. The bluish-grey area

does not reach the apex of the wing, but its inner edge reaches the black postcellular band near the costa, extends obliquely to below vein 3, from which point the grey area continues to the submedian as a marginal spur. The black discal lines are placed as in the allied forms. Hind wing marked as in *aurinna*, but the dark postdiscal band is placed nearer the submarginal band.

Underside with the yellow-brown ground-colour of *lucinda* but with more extended black markings. Fore wing with the discal lines very heavy. Postdiscal black band very broad, especially at vein 5. A submarginal band of 8 spots which are distally pale yellow and proximally dark yellow-brown. The spot in 4 is the smaller and the one in 6 the larger, the anterior four separated only by the veins. A submarginal row of grey-white dots. Hind wing with heavy black discal lines. A broad black distal border in which is placed a submarginal band of seven spots of the same colour as the proximal area; the three posterior spots are more square-shaped and larger than the others, the two lower ones only separated by the submedian. A submarginal row of indistinct brownish dots.

Length of fore wing, 26 mm.

Habitat.—South Colombia: Moutepe, Putumayo, one ♂. Received from the firm of R. Kruger.

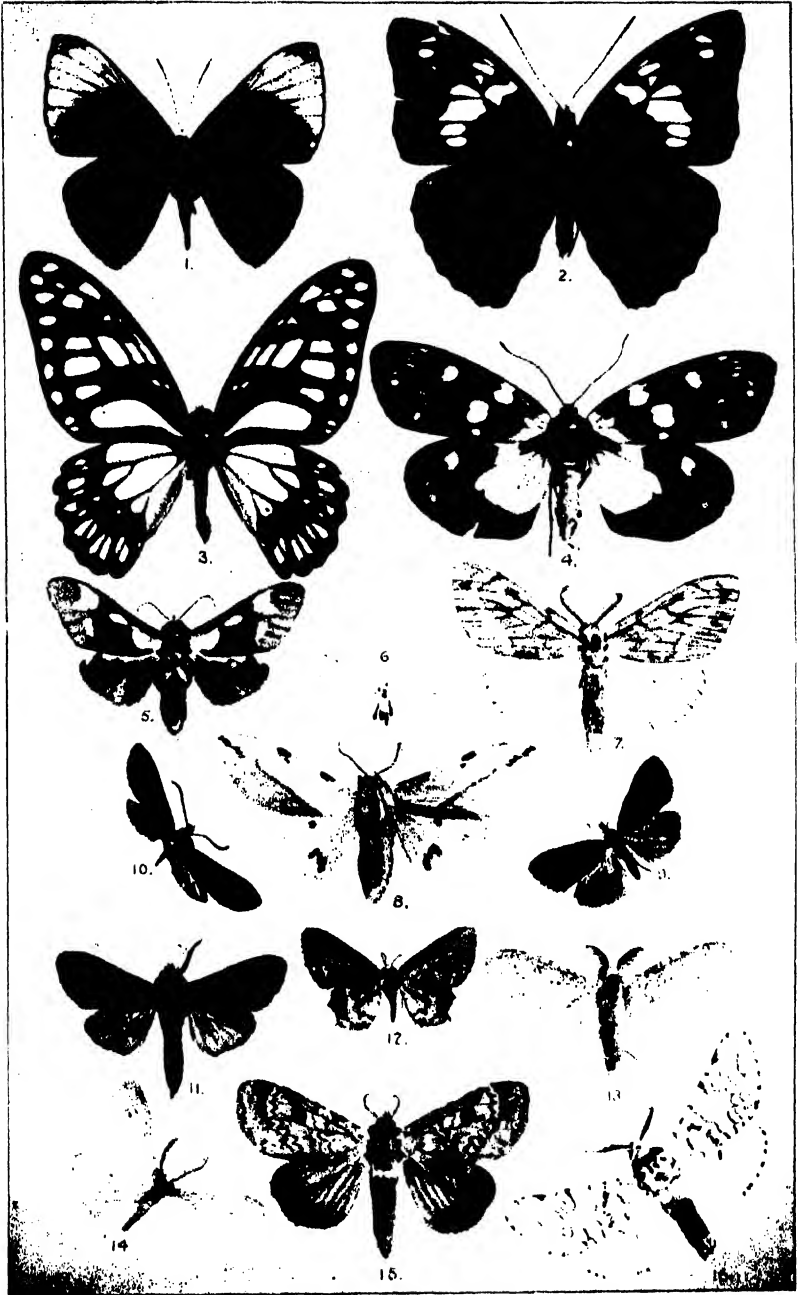


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DESCRIPTIONS OF SOME MOTHS COLLECTED BY
MESSRS. C., F., AND J. PRATT IN NEW GUINEA,
CERAM, BURU, AND SUMATRA.

By G. TALBOT.

AMATIDAE.

Amata octomaculata sp. nov.

This distinct species may perhaps be placed near *longipennis* Walk. on account of the white abdominal markings.

♀. Wings hyaline with black marginal borders. Fore wing with the hyaline area divided by the veins into eight patches: A wedge-shaped cell-patch from vein 3 to below vein 2, a large oblong patch below the cell, a square-shaped patch filling the basal half of cellule 2, an oblong patch in cellule 3, a similar but narrower one in 4, a shorter and narrower one in 5, a broader one in 6, a short wedge-shaped one in 7, its point placed inwards and not reaching the edge of the patch below; a fine line below the submedian. None of these patches reaches the distal margin.

The hyaline area of the hind wing is divided by the veins into four patches. A basal cell-patch separated from a short one in 3 by the black costal area, one in 2, and a larger one from vein 2 to the submedian. The outer black marginal border is widest at vein 3.

Antennae simple, black, white at the tip. Head and palpi black, frons buff, collar white, a white spot at the side of the prothorax, patagia and tegulae black. Pectus black with a white spot on each side. Legs blackish-brown, the tarsi with the first segment white above. Abdomen blackish-brown, the 2nd segment with a white dorsal bar which is obscured in the middle, the sixth segment edged with white all round, a white lateral spot on the fourth and fifth segments.

Length of fore wing, 19 mm.

Habitat.—South-west Sumatra: North Korintji Valley, September—October, 1921, one ♀.

ARCTIIDAE.

1. *Spilosoma semialbescens* sp. nov. (pl. ii, fig. 8).

This species appears to have no near ally, but belongs to the section with bipectinate antennae.

♂. Ground-colour creamy-white, with or without a yellow tinge. Fore wing with an oblique fuscous-brown line from a blackish spot on the inner margin before the middle and extending to vein 6; at vein 6 it is sometimes broken and directed proximad, but is usually continued to a heavy line of blackish spots reaching the apex. Distal area more or less dusted with brown or tinged with yellow-brown on the inner margin. Two black costal spots, one near the base and one near end of cell; a small black spot in the apex of cell. Hind wing tinged with yellow-brown over the inner area. Three black spots in the anal area of cellules 1 b---c. One or two small black submarginal spots in 4 and 5, and a black spot on the upper discocellular.

Underside as above. Fore wing with the oblique line less distinct and some yellow tinge in the cell and along the costa. Hind wing with the costa tinged with yellow, a black basal spot in 8.

Antennae pale-brown. Head whitish-buff, frons fuscous-brown, pectus yellow-brown, legs fuscous-brown. Abdomen yellow-brown with dorsal and lateral rows of black spots, ventral surface yellow-brown to whitish-buff.

♀. Marked similarly to the ♂. Fore wing without the costal spots, and without the line of spots between apex and vein 6. The apical and distal marginal areas suffused with pale-brown. Hind wing washed with yellow, the anal spots very large.

Underside yellowish-buff, the apical area of fore wing darker. One specimen with the hind wing and underside yellowish-buff.

Length of fore wing, ♂ 24—26 mm., ♀ 33 mm.

Habitat.—Central Ceram, Manusela Range, 6,000 feet, October—December, 1919 (holotype); 4,600 feet, January, 1920 (allotype); 3,000 feet, January—February, 1920, a long series of ♂♂ and one ♀.

2. *Spilosoma styx* B.-Bkr. (1910) *albistriga* subsp. nov.

♂. Ground-colour paler brown. Fore wing above with veins more prominently white. Median spot much larger, in two specimens reaching vein 2. Subapical white band more than twice as broad and reaching the distal margin. A white distal stripe on the submedian fold, reduced in one specimen. A white submarginal spot on vein 2,

prolonged in two specimens to a short oblique bar reaching vein 3. Hind wing with two white marginal marks: A somewhat triangular one in 1c and a more square shaped one in 4-5. A white postdiscal dot or spot in 5.

Underside of fore wing as above, with also a short streak in the cell and a similar subcostal one above. Hind wing as above with also a proximal white stripe in 8, not reaching the base. The ventral stripe of abdomen more white than yellow.

Habitat.—Dutch New Guinea, Weyland Mountains, Nomnagihe, 25 miles south of Wangaar, 2,000 feet, January—February, 1921 (holotype), and two others.

3. *Maenas punctatostrigata* B.—Bkr. (1904) *ceramensis* subsp. nov.

♂. Upperside of fore wing agrees with *punctatostrigata* in having from two to four marginal dots in cellules 3-6, the ones in 4 and 5 larger and usually connected with the postdiscal band. The postdiscal band is formed of the distal row of spots from the apex to vein 3; these are mostly larger than in the New Guinea form, as are also the spots of the discal band. Other spots and colouring as in *punctatostrigata*, and variable.

Habitat.—Central Ceram, 3,000 feet, January—February, 1920 (holotype); also at 4,600 feet, January; 6,000 feet, October—December, 1919. A long series.

It is to be noted that this species and the similar *avola* B.-B. (1908) occur together in Dutch and British New Guinea.

4. *Pericallia quadrimaculata* sp. nov. (pl. ii, fig. 5).

A distinct species belonging to the section with ciliate antennae and perhaps allied to *distinguenda* Walk. (1864). The tegulae and patagia are unicolorous.

♂. Ground-colour fuscous-brown. Fore wing above with four white patches; one between the lower edge of cell and submedian, touching these veins, and extending from the base to three-quarters of the distance between base and vein 2; an ovate one in the middle of cell; a postcellular one from the costa to vein 4, incurved on its outer edge; an oblong one from the submedian fold to vein 3, sometimes continued to join the patch above it; a small spot or streak in the cell proximal of the oval spot.

Hind wing with the costal area yellowish-buff for more than half, usually extending over the greater part of the cell, but in some specimens

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not entering the cell. A small costal spot of yellowish-buff placed before the apex; in some specimens conjoined with the costal yellow and continued as a submarginal band to vein 2 (this var. not taken as type).

Underside as above. Fore wing paler distally, and the basal patch yellowish-buff.

Antennae ciliate, fuscous-brown. Head buff-yellow with a fuscous-brown spot on vertex and one on either side of frons. Palpi and pectus buff-yellow. Patagia (prothoracic lappets) fuscous-brown edged with buff-yellow. Tegulae fuscous-brown. Base of thorax buff-yellow with some brown admixture. Basal segments of abdomen clothed with yellow-brown hair, dorsum blackish-brown, anal segment and remainder of abdomen buff-yellow with a double lateral row of blackish-brown spots, and similar spots on the middle ventral line. Femora buff-yellow, the anterior ones fuscous-brown at the tibial end. Tibiae and tarsi fuscous-brown with some slight buff scaling.

Length of fore wing.—22 mm.

Habitat.—Central Ceram, Manusela Range, 4,600 feet, January, 1920 (holotype). Also at 3,000 feet, October—November, 1919, and January—February, 1920, 6,000 feet, October—December, 1919. A series of ♂♂.

HYPSIDAE.

Deilemera personata sp. nov.

Allied to *nercnoides* Butl. with similarly coloured abdomen.

♀. Fore wing with a large white area with black costal and distal margins. An oblong costal spot, marking the upper spot of the band in most other species, is joined to the white area, and proximally of this spot the costal area to within the cell, including a distal projection, is black dusted with grey. The distal marginal area from the costal spot to the inner margin shortly before the tornus is deep black; its inner edge is deeply dentate, showing six teeth. The submedian vein is thinly edged with black posteriorly, forming a line which joins the marginal black. A black postdiscal spot, which is somewhat bobbin-shaped, is placed in the basal part of cellule 2. Fringe black above vein 2, white below this vein.

Hind wing white. A narrow black marginal border extends from the costa before the apex, where it is broader, to the anal angle, but below vein 4 it is broken into triangular spots on the veins, and above

vein 3 is deeply toothed on the veins, thus resembling the edge of the marginal black on the fore wing.

Underside as above. Hind wing with a short basal costal streak, and a spot at the base of the cell.

Antennae black. Head yellow marked with black. Palpi with anterior half of middle segment and third segment black. Legs fuscous marked with yellow. Patagia grey-white edged with yellow; tegulae black edged with pale yellow. Abdomen with dorsal black bands, a subdorsal row of black spots, subventral black spots on segments 2-4, and black ventral bands on segments 5-6.

Length of fore wing, 24 mm.

Habitat.—South-west Sumatra: North Korintji Valley, 5,000 feet, September—October, 1921, one ♀.

AGARISTIDAE.

Argyrolepidia comma sp. nov.

The single specimen of this species was obtained at the same place with specimens of typical *megisto* Bdv. (1832). The postdiscal band of the fore wing is not placed as in *megisto* but as in *restrictus* Roths. (1897). Have we two species or has the rather variable *megisto* suddenly produced an atavistic form representing a type from which sprang the Bismarck Islands *restrictus*?

♀. Resembles the allied forms. Fore wing above with heavily marked distal stripes of which there are eight, with the addition of a thin streak on the submedian fold. Postdiscal band placed and shaped as in *restrictus* but much larger and broader, narrowed anteriorly and pointed just below the costa, curved outwards from vein 5 and reaching the submedian; on its inner edge strongly incurved between the base of cellule 3 and the origin of vein 2 where it makes a projection to meet the cell-bar; this band is somewhat comma-shaped. Discal band farther from the basal band than in *megisto*, anteriorly narrowed, not touching the inner margin. Basal band as in *megisto*, its posterior spur shorter.

Hind wing with a white proximal area from the upper cell-margin to inner margin, and to well beyond the cell distad.

Underside of fore wing with the postdiscal band well defined, and the cell-bar represented by a small rounded spot. Hind wing as above. The rest of this insect is coloured as in *megisto*.

Habitat.—Dutch New Guinea: Nomnagihé, 25 miles south of

Wangaar, Weyland Mountains, 2,000 feet, January—February, 1921, one ♀.

ZYGAENIDAE.

1. *Cyclosia pieroides* Walk., *sumatraensis* subsp. nov.

C. pieroides Walk. is figured in Seitz' *Macrolep.* x, pl. 24.

The present subspecies is not strongly differentiated.

♂. Fore wing above not different. Hind wing with the middle discocellular longer and the cell veinlet more removed from the cell at its distal end. Basal area of hind wing dusted with glaucous-green.

Underside of fore wing with inner margin bordered with grey dusted with green. Hind wing marked with deeper yellow and a basal patch of dull orange below cell; distal margin more black with much smaller green patches.

Habitat.—S.W. Sumatra: South Korintji Valley, 2,000 feet, October, 1921, one ♂.

2. *Cyclosia midamia submaculans* Walk. (1859), f. *latistriga* forma nov.

♂. An extreme development of the form *strigata* Druce (1891). The white spots and stripes on the fore wing are larger. On the hind wing the white stripes are all very broad, and in the submedian area are only divided by the veins.

Habitat.—S.W. Sumatra: Barisan Range, western slopes, 2,500 feet, October-November, 1921, two ♂♂. The paratype has only the stripes below the first submedian of the hind wing as broad as in the type.

3. *Erasmia sanguiflua* Drury (1773) *korintjiensis* subsp. nov.

Allied to *lugens* Dohrn. (1906) from N.E. Sumatra, but the hind wing has a blue distal area, and the submarginal spots do not form a band.

♀. Fore wing above with their vein stripes prolonged to the margin, and the double submarginal spots more elongate on veins 2, 6 and 7, and somewhat clouded. Basal spots orange, but small and indistinct. Hind wing blue over the distal area as in *sanguiflua*. The submarginal spots placed near the margin, much larger than in *sanguiflua* and ovate.

Underside of fore wing with the submarginal spots grey-white edged with blue and produced to short stripes on the veins. Basal spots

yellow and other blue spots smaller than in *sanguiflua*. Hind wing with submarginal spots as above, but otherwise as in the typical form.

Habitat.—S.W. Sumatra: North Korintji Valley, 5,000 feet, September—October, 1921, one ♀.

4. *Agalope hemileuca* Roths. (1904) *buruensis* subsp. nov.

♂. Fore wing with the middle and lower discocellular longer. Proximal area white to before vein 2 in the cell, and to beyond the angle of vein 2 below the cell. Distal area smoky, darker on the margins, and black at extreme base. Hind wing white, distal margin smoky, narrowing posteriorly.

Differs from *ceramensis* Joic. and Talb., 1922, in the complete absence of a dark band crossing the cell of the fore wing, and in the longer discocellular veins as noted.

Habitat.—Buru: Kako Tagalago, 2,700 feet, May 1922 (holotype); Gamoe 'Mrapat, 5,000 feet, March—April, 1922, one ♂.

5. *Eterusia joiceyi* sp. nov. (pl. ii, fig. 4).

Allied to *subcyanea* Walk. (figured in Seitz' *Macrolep.*, x, pl. 6d) from Java, but differs especially in the large proximal white area on the hind wing.

♀. Fore wing with the white markings much larger than in *subcyanea* and all chalky-white with a very slight tinge of yellow. The discocellular spot nearly as large as the spot below the first submedian; a small spot below the second submedian under the discal patch. Hind wing blackish-brown at the base of cell and costa and a large proximal chalky-white area from the cell to the inner margin and extending as a band through the proximal area of cell, almost to the costa, and into part of cellule 2, its distal edge well defined and slightly rounded; a white discocellular spot as large as the one on the fore wing; two blue submarginal and smaller spots, slightly mixed with white in 3 and 4; some indistinct blue marks in 1 b, 1 c, 2, 5 and 6. Ground-colour of hind wing black with a purplish tinge.

Underside with larger white markings, those in the distal area edged with blue. On the hind wing the spots in 3 and 4 white; ground-colour black with a purplish tinge. Fore wing with the distal spots edged with blue, the upper and lower edge of cell blue, lower submedian broadly edged with blue, some basal blue and costa edged with blue. Hind wing with a blue spot at base of 8; costa slightly edged with blue,

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also upper edge of cell and lower edge between veins 2 and 5 ; a blue bar from the inner angle below 1a to before 1c, followed by a submarginal spot in 1b, a dot in 1c and a small spot in 2.

Antennae, head, thorax, pectus and legs black. Abdomen white with a faint yellow tinge, banded with black on the ventral surface which is mesially marked with violet-blue, anal tuft pale yellow, segments 1 and 2 violet-blue above.

Length of fore wing, 33 mm.

Habitat.—S.W. Sumatra, slopes of Mount Korintji, 7,300 feet, August—September, 1921, one ♀.

6. *Pidorus latifasciata* sp. nov.

Allied to *bifasciata* Walk. (Jordan in Seitz' *Macrolep.* x, pl. 6g). As this species is not in Kirby's Catalogue it is difficult to find the date of publication ; the work of Seitz is lamentably lacking in this respect, and often the trouble taken to give a long reference is negated by omitting the year of publication.

♂. Fore wing with the 3rd subcostal proximal of the 5th. Ground-colour blackish-brown, paler below. Fore wing with a broad discal band of a dirty-white colour, 4 mm. wide between veins 2 and 4, crossing the outer half of the cell behind vein 2, and distally extending into the base of cellule 4 ; the edges of this band are irregularly dentate. Veins striped with pale brown. Hind wing unmarked ; below with the inner area much paler than the rest of the wing.

Antennae blackish-brown, head fuscous-brown, collar red, legs, pectus and ventral surface of abdomen fuscous-brown ; thorax and abdomen blackish-brown above.

Length of fore wing, 15 mm.

Habitat.—S.W. Sumatra, Korintji District, Barisan Range, western slopes, 2,500 feet, October—November, 1921, one ♂.

7. *Hemiscia albivitta* Roths. (1899) *caerulifascia* subsp. nov.

♀. Distinguished by the shorter white band on the fore wing, being followed by a blue band to the inner margin. Fore wing purplish-brown, distal area lighter. White discal band filling the outer part of the cell and reaching to near the first submedian, slightly narrowed anteriorly and posteriorly, its inner edge crossing the base of vein 2, its outer edge entering the base of cellule 4. A dark blue discal band from the costa to inner margin, for the greater part invaded by the white

band, but forming a distal edging to this band, and posteriorly curved inwards, narrowing below the submedian.

Hind wing black. A large white and rounded proximal area shaped as in the ♀ of *acrita* Roths. (1899).

Underside of fore wing with the discal band outwardly bordered broadly with dark blue. Hind wing with the costal and distal areas dark blue.

Habitat.—Dutch New Guinea: Weyland Mountains, 5,000 feet, June, 1920, one ♀.

BUTTERFLIES FROM SOUTH-EAST SUDAN.

By G. TALBOT.

In the *Trans. Ent. Soc. Lond.* lxxvi, pt. 1, p. 25, Dr. G. D. Hale Carpenter gives a list of butterflies collected in the Didinga, Imatong and Nuba Mountains, south-east Sudan. He lists 173 species.

The Hill Museum has recently received two small collections made in the Imatong Mountains by Captain R. Whalley. These contained forty-two species not mentioned by Dr. Carpenter and a list of them will serve to make our knowledge of the butterflies from this interesting part of Africa more complete, and emphasize the affinity which this area has with Uganda and Kenya.

No Satyridae were received and the Hesperiiids were not studied.

Species marked with an asterisk are also noted by Carpenter.

PAPILIONIDAE.

**Papilio dardanus cenea* Stoll. ♂.

No males were recorded by Carpenter.

Papilio bromius chrapkowskii Suff. ♂.

Papilio mackinnoni Shpe. ♂.

Papilio zoroastres homeyeri Plotz ♂.

Papilio philonoe whalleyi Talb. ♂ (see p. 72).

PIERIDAE.

Leptosia alcesta Cram. ♂.

Mylothris clarissa Butl. ♂ ♀.

**Appias epaphia contracta* Butl., ♂ ♀. (Carpenter notes the typical form.)

**Pieris severina* f. *sigirrensis* Stnd. ♂. } (Only the typical form
Pieris severina f. *infida* Butl. ♀. } noted by Carpenter.)

Pieris theora lortzini Suff ♂.

**Pieris calypso* subsp. ♂ ♀. (Carpenter refers his specimens to the typical form.)

Pinacopteryx orbona vidua Btlr. ? ♂. If it is this form the black marginal spots on both sides of the hind wing are larger than usual.

Teracolus bacchus Butl. ♀.

**Teracolus eupompe* f. *pseudacaste* Butl. ♂. (Carpenter notes the typical form.)

**Teracolus achine antivippe* Bdv., ♂ ♀. (Carpenter notes the typical form.)

Teracolus omphale f. *omphaloides* Butl., ♂ ♀.

Teracolus antigone phlegetonia Bdv., ♂ ♀.

**Teracolus evarne* f. *citreus* Butl., ♂. (Carpenter notes the typical form.)

**Eronia cleodora* f. *erixia* Hew. ♂. (Carpenter notes the typical form.)

Eronia argia Fabr. ♂.

Eronia argia ♀ f. *poppea* Don. The orange area fills the basal area below the cell in this specimen.

Terias brenda D. and H., ♂.

Terias floricola f. *ceres* Butl., ♂.

Terias hapale Mab., ♀.

NYMPHALINÆ.

Charaxes bipunctatus Roths., ♂.

Charaxes achaemenes Feld., ♂ ♀.

Charaxes zelica depuncta J. and T. (1921), ♂.

Euphaedra eleus Drury, ♀.

Euphaedra spatiosa sudanensis Talb., ♂ ♀.

**Aterica galene extensa* Heron, ♂, ♀. The ♀ has the hind wing patch pale brown. (Carpenter notes the typical form.)

Neptis metella D. and H., ♂.

**Hypolimnas misippus* L. One ♀ intermediate between *inaria* and *alcippoides*.

Hypolimnas dubia anthedon Dbl., ♂.

Hypolimnas salmâcis platydema R. and J., ♂.

Salmâcis cacta Fbr., ♂.

Precis stygia gregorii Butl., ♂.

Precis antilope f. *simia* Wlgr., ♂.

Atella columbina Cram., ♂.

ACRAEINAE.

Acraea alica Shpe., ♂ ♀.

**Acraea terpsichore venturina* Thur., ♂ ♀. (Carpenter does not refer to this race.)

Acraea acerata f. *vinidia* Hew., ♂ ♀.

Acraea caldarena Hew., ♂, ♀.

Acraea caldarena f. *recaldana* Suff., ♀.

Acraea neobule D. and H., ♂.

Acraea admatha Hew., one ♂ with a small white hind wing patch limited by the submedian.

Acraea astrigera f. *brunnea* Eltr., ♂ ♀.

Acraea quirina Fabr., ♀.

LYCAENIDAE.

Hypolycaena liara Druce, ♂.

Hypolycaena philippus Fbr., ♂.

Lycaenesthes laryda Cram., ♂.

Lycaenesthes amarah Guer., ♂, ♀.

Uranothauma antinorii Oh., ♂.

Nacaduba sichela Wlgr., ♂.

Tarucus mediterranae B.-Bkr., ♂. (Also specimens in the Hill Museum from the Blue Nile).

Oboronia punctatus Dew., ♂.

NEW SUMATRAN GEOMETRIDAE IN THE JOICEY COLLECTION.

By LOUIS B. PROUT.

ADDENDA TO VOL. II.

THE following descriptions were accidentally dropped out from the paper with the above title or—in the case of the *Cleora*—were at the time of publication still *sub judice*.

Subfamily LAURENTIINAE.

7 bis. *Pomasia vernacularia* Guen. *salutaris* subsp. nov.

♂, 24—26 mm.

Considerably larger and brighter than *v. vernacularia* Guen. (1858, Sarawak), the dark markings being sharp rather than broad, the ground-colour costally on fore wing and distally on both wings brighter than ochraceous-buff, deepening to ochraceous-orange; discocellular band of hind wing rather broad and clear.

Habitat.—Barisan Range, western slopes, 2,500 feet, October-November, five ♂♂, two ♀♀.

Possibly a mountain, rather than a strictly geographical form, as specimens from Mount Murud, Sarawak, 1,500 feet, rather closely approach it.

Subfamily GEOMETRINAE.

14 bis. *Plutodes costatus* Butl. *korintjiensis* subsp. nov.

♂, ♀.

On an average larger than *c. costatus* Butl. (1886, N. India), darker—especially in the ♂—the yellow markings on an average ampler, the dark patches of the underside enlarged.

Habitat.—North Korintji Valley, 5,000 feet, September-October,

eighteen ♂♂ (including the holotype) and one ♀ (allotype); slopes of Mount Korintji, 7,300 feet, August-September, three ♂♂, one ♀.

Also from Bukit Kutus, Selangor, 3,450 feet, one ♀ in coll. Federated Malay State Museums.

39 bis. *Cleora xanthorrhages* sp. nov.

♂, 44—51 mm.

Group of *determinata* Walk. (1860). Palpus with terminal joint a little longer. Face rough, with cone well developed. Antenna long, pectinate to just beyond middle, the branches very long, moderately stiff, only in their distal part curled, the slender secondary pectinations well developed. Hind tibia long, slightly exceeding that of *determinata* (8.5-9 mm.), strongly dilated, tarsus scarcely two-fifths tibia. Patagia (tegulae of Hampson) dark-tipped; wing-tegulae rather long, tipped with white. Abdomen above with dark subbasal belt and more or less strongly developed paired black spots or dots.

Fore wing with termen slightly less oblique than in *determinata*; SC¹ and SC² separate; fovea moderate; coloration, markings and range of variability nearly as in the allies, the white ground-colour, however, scarcely ever conspicuous except at base, in parts of distal area and occasionally in proximal half of median area, the brown suffusion and blackish irroration generally strong and widely spread; cell-mark narrow; median area rather broader than in *determinata*, generally 5.5 to 6.5 mm. at M—R³, the projection of postmedian at R¹—R² rather strong; subterminal rather thick, generally somewhat interrupted, nowhere much dentate, posteriorly straightish; apex hardly white-mixed.

Hind wing with costal margin relatively long, termen more crenulate than in *determinata*; generally whitish proximally, from the median line (which is vague, generally touching the proximal side of cell-mark) outward concolorous with fore wing, similarly marked.

Underside drab, suffused with grey (much less blackish than that of *determinata*), whitest posteriorly, darkest distally to postmedian line, with some pale admixture at termen; cell-spots broader than above (dark except on DC), but much less large than in *determinata*, postmedian moderate or rather thick, blackish.

♀, 47—50 mm.

Much whiter than the ♂, but much more irrorated than that of *determinata*, with the brown bands above and beneath subobsolete, apex of fore wing not whitened above, further distinguished, like the ♂, by the narrow cell-marks, non-dentate subterminal, &c.

Habitat.—Slopes of Mount Korintji, 7,300 feet, August-September, 1921, fifty ♂♂, nine ♀♀.

Distinguished from *pendleburyi* Prout (1929), which occurred with it though sparingly, by the more crenulate hind wing, lack of white apex and of V-shaped tooth in the subterminal line between the medians, much less *determinata*-like underside and some slighter and more subtle differences which become apparent when good series of each species are placed side by side.

Apart from occasional eccentric aberrations, *C. xanthorrhages* may be regarded as trimorphic in the ♂. The form which I have designated name-type (nineteen ♂♂) has a broad ochraceous-buff streak on fore wing about R¹ from cell-spot to subterminal and a second (sometimes slender) on the greater part of M². A second form (eight ♂♂) has the median area, except costally, and a part of the distal, yellowish-buff or ochraceous-buff. The remaining form, perhaps the phylogenetic "type," is plainer brown. Three ♀♀, including the allotype, have the anterior ochraceous streak, the rest are plainer.

39 ter. *Cleora mecistoscia* sp. nov.

♂ ♀, 42—50 mm. (one stunted ♀ smaller).

Differs from *meceoscia* (supra, p. 50, Ceram) as follows:—

Hind tarsus of ♂ slightly shorter (two-thirds hind tibia). Thorax with larger dark spots in front and nearly always an ochreous admixture in middle.

Fore wing in ♂ with fovea larger, conspicuously scaleless on upper-side; the blackish shade around the cell-mark, especially in the ♂♂, still larger, generally more quadrate or oblong; median area white or (oftener) buff or warm buff or even antimony-yellow, in most ♀♀ and nearly all ♂♂ with more or less broad, cloudy median shade posteriorly; postmedian line more sharply black and dentate; usually accompanied distally by some white dots or spots between the teeth. Hind wing with crenulate postmedian line well developed. Underside more irrorated and clouded than in *meceoscia* and *subbarbara*.

Habitat.—S.W. Sumatra, slopes of Mount Korintji, 7,300 feet, August-September, 1921, thirty-nine ♂♂, sixteen ♀♀.

Variable, especially in the width of the median area, which is often greatly constricted in the submedian area, and in the colouring of the fore wing, a fine aberration, occurring in both sexes, being predominantly warm buff or antimony-yellow clouded with ochraceous-buff or ochraceous-orange.

A REVISION OF THE GENUS *PHYCIODES* Hübn.
(Lepidoptera *Nymphalidae*).

BY ARTHUR HALL, F.E.S.

(*Supplement to* THE BULLETIN OF THE HILL MUSEUM, Vol. III.)

(*Continued from* Vol. II, No. 3, p. 44.)

13. *P. montana* Behr.

Melitaea montana Behr., *Proc. Cat. Ac.*, 1863, p. 85; Streck, *Cat.* p. 121; *Phyc. montana* Edw., *Cat.* p. 36 (1884); Holland, *Butt. Book*, p. 156, t. 17. f. 26, 27 (1898); Skinn. *Cat.* p. 17, n. 122 (1898), Wright, *Butt. West Coast*, p. 168, t. 21 f. 205 b.c. (1906); Rüb. in Seitz' *Macrolep.*, v. p. 437, t. 89, f. E 3 (1913); Barnes and McDunnough, *Check List*, p. 10, n. 251 (1917).

= *Mel. orsa* Boisd., *Lep. Cat.*, p. 55, n. 41 (1869).

Exp. ♂ 30-37, ♀ 35-40 mm.

♂. Upperside, fore wing with the usual spots in cell well marked, the bar before end paler than the discoidal bar; from one to four small spots in basal part of 1 b; discal spots light fulvous or somewhat yellowish, large, contiguous, that in 1 b the shortest; black band between discal and postdiscal spots more regular than in *P. mylitta*; postdiscal spots large, roundish, fulvous, of nearly uniform size; submarginal fulvous spots generally present in 2 to 7, the one in 3 larger, hind wing with the usual fulvous subbasal area; discal band generally a little paler than postdiscal, its spots of uniform size except that in 1 b, which is smaller and bent; black line between discal and postdiscal bands, thin or obsolete in 4 to 6; postdiscal spots fulvous, contiguous, marked with black dots, the latter often obsolete in 4 to 6; submarginal lunules thin or fairly heavy, the three anterior ones often fused with the postdiscal spots.

Underside fore winged dull fulvous; light spots of upperside faintly indicated in paler; at most a small black median spot in 1 b, and two others, postdiscal, in 1 b and 2 hind wing dull pale yellow, with thin or feebly marked brown lines; submarginal lunule in 3 only prominent when bordered by a slightly darker shade.

♀. Larger than ♂, wings more rounded; discal band of both wings generally distinctly yellowish; hind wing sometimes with fulvous marginal spots; otherwise as in the ♂.

Habitat.—California, Nevada.

This species is very similar to some of the forms of *P. campestris*,

but it is a larger and brighter insect, and may generally be distinguished by the black line between the discal and postdiscal bands of the hind wing, tending to become broken at the middle, and by the postdiscal dots being absent or obsolete anteriorly. According to Wright it is a high mountain form, flying at altitudes of 6,000 to 9,000 feet, chiefly in the Sierra Nevada. The only dated specimens before me were taken in June and July. Valve shorter than in *P. campestris*, the apical process less developed. Uncus with very short hooks.

14. *P. campestris*, Behr.

Melitaea campestris Behr., *Proc. Cat. Ac.*, iii, p. 86 (1863); *Eresia campestris* Reak, *Proc. Ent. Soc. Phil.*, vi, p. 142 (1866); *Phyc. campestris*, Barnes and McDunnough, *Check List*, p. 10, n. 279 (1917).

= *Mel. pratensis* Behr., *Proc. Cat. Ac.*, iii, p. 86 (1863); Streck. *Cat.* p. 121 (1878); *Phyc. pratensis* Edw., *Cat.* p. 36 (1884); Holland, *Butt. Book*, p. 154, t. 17, f. 37; 38 (1898); Skinn. *Cat.* p. 17, n. 117 (1898); *Butt. West Coast*, p. 166, t. 21, f. 201 (1906); Rüb. in Seitz' *Macrolep.*, v, p. 436, t. 89, f. D. 3, 4 (1913).

= *P. orseis* Godm. and Salv. (non Edw.), *Biol. Cent.-Am. Rhop.*, i, p. 193 (1882).

(a) *P. camillus* Edw., *Trans. Am. Ent. Soc.*, 1871, p. 269; Mead, *Rep. Wheeler Exped.*, v, p. 764 (1875); Edw. *Cat.* p. 36 (1884); Skinn. *Cat.* p. 17, n. 119 (1898); Holland, *Butt. Book*, p. 155, t. 17, f. 22, 23 (1898); Rüb. in Seitz' *Macrolep.*, v, p. 437, t. 89, f. D. 7, 8 (1915); Barnes and McDunnough, *Check List*, p. 10, n. 250 (1917).

= *P. emissa* Edw., *Trans. Am. Ent. Soc.*, 1871, p. 269.

P. campestris campestris Behr.

Exp. 28—38 mm.

♂. Upperside black, markings fulvous and yellow, fore wing with the usual fulvous spots in cell rather broadly bordered with black, the bar before the end yellowish, prominent; discal spots varying from pale fulvous to yellow, well separated, that in 1b small and often double, that in 3 very small; generally only one small spot in 1b below the cell; postdiscal spots fulvous, round, of uniform size, that in 1b more distal than that in 2; a fulvous or yellowish submarginal spot in 3, the other submarginal spots absent or linear. Hind wing with two prominent subbasal spots in cell, more rarely one in 7; discal band pale fulvous or yellow, its spots of uniform size or slightly smaller posteriorly, that in

1 c often absent; postdiscal spots fulvous, taking the form of oval rings centred by black dots, the outer part of the rings frequently obsolete; submarginal lunules pale yellow, very thin when present, often partly or wholly obsolete, that in 3 being the last to go. Underside fore wing dull fulvous with the pale spots of upperside indicated in yellowish; a small median spot in 1 b and two postdiscal spots near hinder angle are usually the only black spots present, but in some examples the pale discal band is bordered internally by small black spots. Hind wing dull pale yellow with fine, often very faint brown lines and postdiscal dots as in *P. montana* Behr.; submarginal lunule in 3 scarcely paler than ground colour, only prominent when bordered by a dark shade.

♀. Wings more rounded than in ♂, upperside similar. Underside of hind wing varied with brownish, with darker brown lines; discal band, several subbasal spots and the submarginal lunule in 3 whitish.

Habitat.—Alaska, Eagle; Canada, N. W. Territory, British Columbia, United States, Oregon, Washington, California, Nevada; Mexico, Durango City, Cordoba, Orizaba, Cuesta de Misanbla, Jalapa.

Dated specimens May to August.

P. campestris Behr. and *P. pratensis* Behr. are sexes of the same species; both names were published on the same page, so the one printed first has priority. A common insect in the more northern part of its range, but scarce and local in Mexico.

(a) *P. campestris camillus* Edw.

♂. Upperside much more brightly marked than in *campestris campestris*. Fore wing spots in cell more distinct; discal spots clear pale yellow larger; discal spots paler fulvous, sometimes partly yellowish. Hind wing discal band always yellow, broader on an average, the black line separating it from the postdiscal spots not so thick; postdiscal spots brighter fulvous, seldom reduced to semicircles.

Underside fore wing, with discal spots, clear pale yellow, often bordered internally by heavy black median spots; black postdiscal spots in 1 b, and 2 larger; submarginal lunules yellowish-white, hind wing paler, almost whitish, sometimes varied with brownish, in cell and postdiscal and marginal areas; brown lines and dots a little sharper; submarginal lunule in 3 always whitish and prominent.

♀. Similar to ♂, except that both wings generally have a complete submarginal series of pale yellow lunules above, and that on the underside of hind wing the brown lines are more strongly marked and the discal band and submarginal lunules white and better defined.

Habitat.—California, Arizona, New Mexico, Utah, Montana, Texas, Kansas.

Dated specimens May to September inclusive.

It seems impossible to retain *P. camillus* as a species distinct from *P. campestris*. Brightly coloured examples of *camillus* from Colorado, New Mexico, etc., appear very different from the dark form of *campestris* prevalent in Vancouver and British Columbia, but in California the two forms grade so completely into one another that no line can be drawn between them, nor do the male genitalia show any differences. There are also specimens resembling *campestris* above and *camillus* beneath, and vice versa.

Holland's figures of both forms are fairly good, that of *campestris* (as *pratensis*) representing a rather paler specimen than the majority. Seitz's fig. of *camillus* ♂ is too dark.

Male armature of *P. campestris campestris*, and *P. campestris camillus*, showing no marked differences from *P. tharos*.

15. *P. orseis* Edw.

P. orseis Edw., *Trans. Am. Ent. Soc.*, iii, p. 206 (1871); *ibid.*, *Cat.*, p. 36 (1884); Holland, *Butt. Book*, p. 154, t. 17, f. 31, ♂ (1898); Skinn. *Cat.* p. 17, n. 118 (1898); Rüb. in Seitz' *Macrolep.*, v, p. 436, t. 89, f. 1). 5 (1913); Barnes and McDunnough, *Check List*, p. 10, n. 252 (1917).

= *Mel pratensis* var. *orseis* Streck., *Cat.*, p. 121 (1878).

Exp. 38—42 mm.

♂. Very similar to *P. campestris* Behr., but considerably larger; discal spots of fore wing forming a more continuous band, those in 1 b and 2 whitish in the type; postdiscal fulvous spots of hind wing appearing as semicircles above the black dots, which are partly fused with the marginal border; submarginal lunules of hind wing whitish, distinct, the series complete.

Underside as in *P. campestris campestris* but rather more strongly marked.

♀. Upperside similar to ♂ but more heavily marked with black; discal bands yellowish, that on fore wing more marked.

Underside as *P. campestris campestris* ♀.

Habitat.—California, Oregon, Washington.

I know very little of this form and doubt whether it is a good species. Skinner suggests that it may be the winter form of

P. campestris, but Barnes and McDunnough maintain it as distinct, without comment. I have only come across two ♂♂ which quite agree with the type, both in the Tring Museum; one of these is from Gold Hill, Oregon (July), the other has no locality. The same collection also contains examples of *P. campestris campestris* taken in the same locality in the same month. An exceptionally large ♀ from Truckee, California, in coll. Hall also seems referable to *orseis*.

The Mexican specimens assigned to *P. orseis* by Godman and Salvin all belong to *P. campestris*.

16. *P. picta* Edw.

Melitaea picta Edw., *Proc. Ent. Soc. Phil.*, ii, p. 505 (1864); Streck. *Lep.* p. 65, t. 8, f. 10 (1874); *ibid.* *Cat.* p. 119 (1878); *Phyc. picta* Godm. and Salv. *Biol. Cent.-Am. Rhop.*, i, p. 193, t. 21, f. 4, 5 (1882); *ibid.* l. c. ii, p. 678 (1901); Edw. *Can. Ent.*, xvi, p. 163 (1884), Holland, *Butt. Book*, p. 156, t. 17, f. 20, 21 (1898); Wright, *Butt. West Coast*, p. 168, t. 21, f. 206, b, c (1906); Rüb. in Seitz' *Macrolep.*, v, p. 437, t. 89, f. E 4, 5 (1913); Barnes & McDunnough, *Check List*, p. 10, n. 253 (1917).

= *P. canace* Edw., *Trans. Am. Ent. Soc.*, iii, p. 206 (1871); Streck., *Cat.* p. 119 (1878).

(a) *Eresia pallescens* Feld. *Verh. Zool. Bot. Geo.* (1869), p. 469; *Phyc. pallescens* Godm. & Salv., *Biol. Cent.-Am. Rhop.*, p. 195, t. 21, f. 18, 19 (1882); *ibid.* l. c. ii, p. 678 (1901); Rüb. in Seitz' *Macrolep.*, v, p. 437, t. 89, f. F 10 (1913).

P. picta picta Edw.

Exp. 23—32 mm.

♂. Very similar to *P. campestris camillus* Edw., but smaller. Upperside fore wing with similar spots in cell, but generally two distinct spots in 1 b below cell; discal spots clear pale yellow, those in 1 b and 3 placed a little more distad than that in 2; postdiscal fulvous spots and yellow submarginal spot in 3 as in *campestris camillus*; hind wing with similar subbasal spots; discal band fulvous or yellowish, less bent outwards at the middle than in *campestris camillus* owing to the spot in 4 being shorter; submarginal lunules yellowish, very thin, the anterior ones always obsolete, sometimes all wanting.

Underside fore wing as in *campestris camillus*, except that the apex is more broadly yellowish, and the brown submarginal line obsolete

anteriorly. Hind wing clear pale yellow, with hardly any markings except the brown postdiscal dots.

♀. Upperside as in ♂, but the submarginal lunules better developed, those in 2 to 4 generally present on fore wing. Underside of hind wing paler, almost white, but with some fine brown lines, one or two of which indicate the position of the discal band.

Habitat.—S. W. United States, Nebraska, Colorado, New Mexico, Texas, Arizona, Southern California; Mexico, Northern Sonora. Type in coll. Holland.

Also somewhat similar to *P. phaon* Edw., but the wings are narrower, and the discal and postdiscal bands of hind wing completely separated by a heavy black line. Early stages described by Edwards. The larva feeds upon Aster, as in most species of this group.

(a) *P. picta pallescens* Feld.

♂, ♀. Only differs from *P. picta picta* in the upperside being a little duller, and the hind wing beneath being a little darker and, in the ♀, more strongly marked, a whitish discal band and some submarginal lunules becoming visible.

Habitat.—Central and Southern Mexico, Puebla, Sierra Madre de Tepic, Jalisco, Morelia, Cordoba, Orizaba, Cuautla, Puente de Ixtla, Cuernavaca, Venta de Zopilote, Oaxaca, Acapulco.

Type in Vienna Museum.

Common from sea level up to 8,000 feet. Dated specimens April, June, July, September, October, November. Male armature differing from that of *P. tharos* and *P. campestris* in the hook-like processes of the uncus being simple and less incurved.

17. *P. vesta* Edw.

Melitaea vesta Edw. *Trans. Am. Ent. Soc.*, ii, p. 371 (1869); Streck. *Cat.* p. 120 (1878); *Phyc. vesta* Edw., *Can. Ent.*, xi, p. 129 (1879); Godm. and Salv. *Biol. Cent.-Am. Rhop.* i, p. 195 (1882); *ibid.* l.c. ii, p. 678 (1901); Holland, *Butt. Book*, p. 152, t. 17, f. 17-19 (1898); Rüb., in Seitz' *Macrolep.* v, p. 436, t. 89, f. C 5, 6 (1913); Barnes and McDunnough, *Check List*, p. 10, n. 245 (1917).

= *Eresia graphica* Feld. *Verh. Zool. Bot. Ges.*, 1869, p. 470.

= *P. vesta* f. *hiemalis* Edw., *Butt. N. Am.*, ii, *Phyc.*, t. 2, f. 18, 19 (1878).

(a) *P. boucardi* Godm. & Salv., *Proc. Zool. Soc.*, 1878, p. 268; *ibid. Biol. Cent.-Am. Rhop.* i, p. 194, A. 21, f. 16, 17 (1882); *ibid.*, l.c. ii, p. 678 (1901); Rüb. in Seitz' *Macrolep.*, v, p. 437, t. 89, f. E 8, 9 (1913).

= *P. vesta* f. *aestiva* Edw., *Butt. N. Am.*, ii, *Phyc.*, t. 2, f. 20, 21 (1878); Barnes and McDunnough, *Check List*, p. 10 (1917).

(b) *P. vesta vestalis* subsp. nov.

P. vesta vesta Edw.

Exp. 25-32 mm.

♂, ♀. Upperside black; all markings fulvous. Fore wing with the usual spots in cell; bar immediately beyond discocellulars thin, narrowed costad; three or four distinct spots in 1 b below cell and sometimes small median spots at the bases of 2 and 3; discal spots moderately large, those in 1 b and 3 the smallest, those in 4 to 6 forming an oblique subcostal band; postdiscal spots rather smaller than those of the discal series, round, the last two near costa very small or absent; a distinct submarginal spot or lunule in 3, the other submarginal spots linear or absent. Hind wing with several distinct subbasal spots; discal band fairly broad, curved, its spots contiguous; postdiscal spots taking the form of rings round the black dots; submarginal lunules thin but well marked, all generally present, that in 3 not enlarged.

Underside. Fore wing basal area, pale fulvous with thin brown or blackish lines; discal and postdiscal spots larger and paler than above; outer margin brown with whitish submarginal lunules, that in 3 large, the others small, sometimes overclouded with brown. Hind wing white or yellowish-white, varied with brown and ashy-grey, with a network of fine but well marked brown lines; discal band and the large submarginal lunule in 3 more or less clear white; post discal black dots not prominent.

The ♀ only differs from the ♂ in the fulvous spots being a little larger.

Habitat.—Texas, San Antonio, Dallas, Honda, Brownsville; Mexico, Durango City, Jalisco, Orizaba, Cordoba, Atoyac, Iguala, Amula, Omilteme, Huahuapan.

Type in coll. Holland.

(a) *P. vesta vesta* f. t. *boucardi* Godm. and Salv.

♂, ♀. Upperside rather more heavily marked with black than in *vesta* f. t. *vesta*; postdiscal rings of hind wing often obsolete distally and submarginal lunules sometimes partly or wholly wanting.

Underside. Fore wing with yellowish submarginal spots. Hind wing ground-colour pale ochraceous; discal band and submarginal spots of the same colour, only defined by fine brown lines; dark shading on distal area often greatly reduced.

Localities as above.

P. vesta seems to be rather a local species in Texas, but is generally distributed in Mexico. Specimens of the winter brood, flying from October to April, are typical, whereas f. t. *boucardi* is found from May to August. The latter form is particularly well marked in some parts of Western Mexico, where specimens as dark as the one figured by Seitz are not infrequent, but the two forms are not sharply separated, specimens resembling the winter form being sometimes found in the summer.

(b) *P. vesta vestalis*, subsp. nov.

♂, ♀. Upperside lighter than in either of the forms of *P. vesta vesta*, the fulvous markings brighter. On the fore wing the discal spots are nearly twice as large as the postdiscal spots and form a more or less continuous band broken only at vein 4. Hind wing discal bandless, divided by the black veins; submarginal lunules generally distinct.

Underside almost as in *P. vesta* f. t. *boucardi*, but the hind wing a little more strongly marked and the discal band generally whitish in the ♀.

Habitat.—Guatemala, Menocal (4,800 feet), Pamplona (5,200 feet), Moran (4,000 feet), Amatiblan (3,800 feet). Type ♂, allotype ♀ and numerous ♂ ♀ paratypes in coll. Hall.

This race does not seem to vary seasonally, examples taken by me in July, August, October and December showing no differences.

Male armature of *P. vesta vesta* differing from that of all allied species in the hooks at end of uncus being triple.

18. *P. simois* Hew.

Eresia simois Hew. *Ex. Butt.* iii; *Eresia* t. 5, f. 30, 31 (1864).

(a) *P. pedrona* Moulton, *Ann. Mag. Nat. Hist.*, 1909, p. 103; Rüb. in Seitz' *Macrolep.*, v, p. 436 (1913).

(b) *P. variegata* Rüb. in Seitz, l.c., p. 437, t. 89, f. F7 (1913).

= *P. simois* Rüb. in Seitz, l.c., p. 437, p. 89, f. F3 (1913).

P. simois simois Hew.

Exp. 22—30 mm.

♂, ♀. Upperside blackish-brown; markings pale fulvous or yellow. Fore wing with two or three very small fulvous spots in cell and from 1 to 3 in 1b below cell; discal spots very narrow, sometimes almost linear, pale fulvous or yellow (whitish in old or worn examples); post-discal spots small, round, those in 1b, 3 and 4 generally present, the rest often absent; a single submarginal spot in 3. Hind wing with several small subbasal spots, a slightly outcurved discal macular band, a post-discal series of rings centred by black spots, and thin or obsolete sub-marginal lunules, all fulvous.

Underside of both wings pale ochreous with the spots of the upperside reproduced in whitish, the submarginal series being present but small; between the discal and submarginal spots of fore wing a large patch of deep black, upon which most of the postdiscal spots are placed.

Habitat.—North Brazil, Pernambuco (coll. Brit. Mus.), Ceara (Mus. Tring), Bahia. Type in Brit. Mus.

Typical *simois* may be distinguished from the other two races by the small size of the spots above, their whitish colour beneath, and the larger black patch on the under surface of fore wing. It is quite a rare insect in collections.

(a) *P. simois pedrona* Moulton.

♂, ♀. Intermediate between *P. simois simois* Hew. and *P. simois variegata* Rüb. Discal spots above larger than in *simois simois*; post-discal spots of fore wing small but five generally present; a single submarginal spot in 3; postdiscal rings of hind wing sometimes reduced to semicircles.

Underside.—All the spots pale yellow, not whitish, larger than in *simois simois*; black patch on fore wing much reduced.

Habitat.—Central Brazil, Minas Geraes, Goyaz. In two examples from Goyaz in the Tring Museum the spots above are rather deep fulvous, recalling *P. vesta boucardi*, and the black patch on fore wing below is almost as large as in *simois simois*.

(b) *P. simois variegata* Rüb.

♂, ♀. Upperside with all spots larger than in *simois simois* or *simois pedrona*; subbasal spots better marked; discal spots in 4-6 of fore wing sometimes distinctly larger than the rest; in many examples,

especially ♀♀, both wings have a complete submarginal series of spots, and on the hind wing these are sometimes quite large and followed by linear marginal spots. Underside as in *simois pedrona* but ground-colour paler, the spots on hind wing less distinct; sometimes the hind wings have a short dark streak from near middle of outer margin to about end of cell.

Habitat.—South Brazil, Corumba and Chapada in Matto Grosso; Uruguay (type); Argentina, Cordoba Hills, Tucuman, Salta, Catamarca, Villa Anna, La Rioja, La Soledad in Entre Rios; S.E. Bolivia, Buenavista. Type in Tring Museum.

Dated specimens October to March inclusive. Rather common at Salta in February and March, frequenting low plants in dry places up to 3,000 ft. Seitz's figures named *simois* and *variegata* on plate lxxxix both represent the latter, and are good, but some specimens are darker and others paler.

Male armature of *P. simois variegata* showing affinity with the *tharos* group but the uncus has only very rudimentary hooks.

19. *P. ursula* Staud.

P. ursula Staud., *Iris*, 1894, p. 70, t. 2, f. 3; Rüb. in Seitz' *Macrolep.*, v, p. 435, t. 89, f. C.3 (1913).

Exp. 28—35 mm.

♂, ♀. Upperside black; markings pale fulvous, unicolorous. Fore wing with the usual markings in the cell, the bars before and behind discocellulars large; three spots in 1b below cell and a small spot at base of 2; discal spots 1b-3 large, contiguous, that in 1b often partly confluent with the median spot in the same interspace or only separated from it by a bent black line; discal spot in 4 well separated from that in 3 but contiguous with those in 4 and 5, the band thus being divided into two parts; postdiscal spots round, that in 3 always absent or reduced to a small dot; submarginal spot in 3 fairly large, that in 4 also generally larger than the rest, the others small but nearly always well marked. Hind wing almost wholly fulvous with a black marginal border containing a submarginal series of well-marked fulvous lunules of uniform size; some blackish striae at base of wing, very small postdiscal black dots and occasionally some indistinct fuscous lunules above the latter.

Underside.—Fore wing pale fulvous; markings of upper surface reproduced in yellowish; postdiscal area brownish; a wavy brown sub-

marginal line. Hind wing pale yellowish with fine brownish striae, brown postdiscal dots and waved submarginal line; a purplish-brown streak commences at the middle of outer margin, where it is broadest, and extends vertically to the base of the wing.

Sexes quite similar.

Habitat.—Bolivia, Cocapata (10,000 ft.); N.W. Argentina, Sierra de Aconquija (2,000 ft.), Salta (3,300 ft.). Type from Cocapata in the Berlin Museum.

Not uncommon at Salta in March; rarer in the Sierra de Aconquija in February. The dark streak which on the underside of the hind wing extends from the middle of the outer margin to the base, distinguishes *P. ursula* from all allied forms except certain aberrant specimens of *P. liriopae orobia*, in which latter the wings are of an entirely different pattern. In general aspect *P. ursula* forms a transition from the group of *P. tharos* to that of *P. liriopae*, but the male armature shows close relationship with the latter, the uncus being urn-shaped with a small spinose lobe at each side, but no distinct hooks.

20. *P. saladillensis* Giac.

P. saladillensis Giac., *An. Soc. Argent.* lxxii, p. 22 (1911); Rüb. in Seitz' *Macrolep.*, v, p. 437, t. 89, f. F.1, 2 (1913).

Exp. 30—37 mm.

♂, ♀. Upperside black; markings light fulvous, unicolorous. Fore wing with the usual spots in the cell, the bar at end of cell and the one beyond discocellulars large; two or three spots in 1b below cell; discal spots large, that in 1b rather widely separated from that in 2, that in 3 contiguous with that in 2 but rather widely separated from that in 4; postdiscal spots somewhat oval, rather large, that in 1b the largest, the last two mere dots; submarginal spot in 3 rather large, that in 4 also nearly always present, the others linear or absent. Hind wing with several subbasal spots, the one at end of cell large and prominent; discal band formed of contiguous spots, widest in 4 and 5; postdiscal spots 1c-4 lunular, the black spots only appearing as slight projections from the marginal border, spots in 5 and 6 larger but without black centres; submarginal lunules in 1c-4 rather large, those in 5-7 small or obsolete. Ciliae greyish, inconspicuous, scarcely marked with black at veins.

Underside.—Fore wing light yellow with the spots of the upper surface reproduced in paler colour, the postdiscal spots placed on a broad

black band; some brownish scaling at apex. Hind wing pale ochreous with a few brown striae and postdiscal dots; a broad transverse postdiscal band of purplish-brown commences at vein 1b and terminates on outer margin beyond vein 5; no distinct submarginal lunules but sometimes a lunulated brown line.

Habitat.—N.W. Argentina, Saladillo, Santa Cruz, Sierra de Aconquija, Salta; Bolivia (coll. Brit. Mus.).

A very distinct species, perhaps nearest to *P. simois* Hew. and *P. ursula* Stgr., but the wings larger and more elongate than in the former, and on the underside the transverse brown postdiscal band on hind wing at once distinguishes it from all allied forms. The latter character is only feebly shown in Seitz's figure, which is a decidedly poor one.

P. saladillensis is common near Salta at 3,000 feet in March, and I also took it in the Sierra de Aconquija at about 1,500 feet in February. Judging by the series of twenty-six ♂♂ two ♀♀ before me it does not vary much.

Valve of the usual shape, with distinct hook-like process at apex and long thorn-like process at one-third below apex. Uncus fairly well developed, ending in a broad, rounded projection. Saccus differing from all close-allied species in having only a single broad projection.

21. *P. anomalus* Godm. and Salv.

P. anomalus Godm. and Salv.; *Trans. Ent. Soc.*, 1897, p. 243; *ibid.* Bid.

Cent. Am. Rhop. ii, p. 679, t. 108, f. 17, 18 (1901).

= *Melitaea anomala* Rüb. in Seitz' *Macrolep.*, v, p. 433 (1913).

(a) *P. coracara* Dyar, *Proc. U.S. Nat. Mus.*, xlii, p. 40 (1912).

= *P. albipunctata* Rüb. in Seitz' *Macrolep.*, v, p. 444, t. 90, f. F.5 (1913).

P. anomalus anomalus, Godm. and Salv.

Exp. 28 mm.

♂. Upper side deep black. Fore wing with an oblique series of four rather small white spots between vein 4 and costa; a very small discal spot in 2, postdiscal dots in 1b, 4 and 5, and a submarginal spot in 3, all white. Hind wing with two fulvous spots in cell, a broad fulvous discal band of uniform width, and a postdiscal series of white dots. Ciliae black and white, prominent.

Underside.—Fore wing black; white spots as above, but there are two additional small spots in cell, the series of postdiscal dots is complete, and besides the submarginal spot in 3, which is fairly large, there are linear spots in the other interspaces; outer margin cinnamon-red. Hind wing pale fawn grey; postdiscal area blackish; several cinnamon-red subbasal spots margined with black; a discal series of linear black spots and a postdiscal series of small white spots; submarginal lunules white, small, that in 3 the largest; outer margin cinnamon-red.

Habitat.—Western Mexico, Colima (coll. Staudinger).

The type specimen of this form, now in the Berlin Museum, seems to be the only one yet recorded.

(a) *P. anomalus coracara* Dyar.

Exp. ♂ 28—34, ♀ 38 mm.!

♂. Upperside.—Fore wing as in *anomalus anomalus*, but with one or two white dots in cell, two in 1b below cell and a complete postdiscal series of dots. Hind wing without the fulvous discal band and cell-spots, which are only indicated by a slightly paler shade.

Underside as in *anomalus anomalus*.

♀. Like ♂ but larger.

Habitat.—S.W. Mexico, Iguala and Los Amates in Guerrero. Abundant in the cañons near Iguala in June and July at an elevation of about 2,500 feet. A series of thirty-six examples in coll. Hall shows very little variation. Type in U.S. National Museum; 1 co-type in British Museum.

A highly peculiar species with no near allies.

Male armature of *P. anomalus coracara* (plate iii, fig. 6) differing widely from that of all other species. Valve small, oval, with a long, sharply bent, hook-like process at apex and two much shorter, blunt processes immediately below it. Uncus represented by a broad, rounded, slightly indented prolongation of the tegumen. Saccus (plate iii, fig. 30) with a single very broad, almost square projection. A majority of the discal scales of both wings in *P. anomalus coracara* are of a curious clavate form which I have not noticed in any other species of the genus, the end being straight with a deep oblong excavation at the middle.

22. *P. fasciata* Hopff.

Melitaea fasciata Hopff., *Stett. Ent. Zeit.*, 1874, p. 349, n. 45;
Phyc. fasciata Rüb. in Seitz' *Macrolep.*, v, p. 438, t. 89, f. F.11
 (1913).

= *Eresia pearcei* Druce, *Proc. Zool. Soc.*, 1876, p. 222, t. 18, f. 3.

= *P. fasciata* subsp. *fasciatella* Rüb. in Seitz' *Macrolep.*, v,
 p. 438 (1913).

Exp. 22—28 mm.

♂. Upperside blackish-brown. Fore wing markings rather deep fulvous, approaching tawny; four lines across cell, two transverse spots in 1b below cell and small median spots at the bases of 2-6; discal spots very narrow, forming a bent stripe broken at vein 4; postdiscal spots small, round, the series complete; submarginal lunules thin but generally all present, that in 3 not thickened. Hind wing without subbasal spots but sometimes a short fulvous line at end of cell; a broad yellow discal band extending from 1b to 6, with or without black postdiscal dots; submarginal lunules thin but well marked, that in 3 not enlarged; sometimes linear marginal spots in 1b-4.

Underside.—Fore wing pale fulvous with markings of upperside faintly indicated in yellowish. Hind wing dull pale yellow with thin brown striae, postdiscal dots and outlined submarginal lunules.

Palpi very long in proportion to the size of the insect.

♀. Unknown.

Habitat.—Peru, Chanchamayo, Pozzuzo, Huancabamba (3,000 to 5,000 feet), Rio Pampacones, San Miguel (6,000 feet), Torontoy (7,000 feet). Type in Berlin Museum.

This rather isolated little species, which perhaps represents the *pelops* group in S. America, is well figured in Seitz. The presence of a fulvous marginal line on hind wing above is of no more local constancy than the presence or absence of the black postdiscal dots, so that *fasciatella* Rüb. falls as synonym. The male armature shows no close relationship with that of *P. proclea* but the valve is very distinctive, having two rather short thorn-like processes just below the apex and at the apex a longer and more slender claw-like process. Uncus short, blunt. Saccus with two projections.

23. *P. proclea* Doubl. and Hew.

Melitaea proclea Doubl. and Hew, *Gen. Diurn. Lep.*, t. 23,
 f. 4 (1847).

Exp. ♂ 20—25, ♀ 25—30 mm.

♂. Upperside black; markings rather bright cinnamon-red. Fore wing with three bars in cell; bar beyond discocellulars broad, contiguous with discal spot in 3; two or three spots in 1b below cell; discal spots of medium size, that in 2 a little more basal than those in 1 and 3, those in 4-6 more distal; postdiscal spots 1b-4 rather large, round, that in 5 small or obsolete, that in 6 always absent but followed by a white dot on costa; submarginal spot in 1b linear or absent, those in 2 and 3 well marked, the latter tending to coalesce with the postdiscal spot in the same interspace, the others wanting. Hind wing with several subbasal spots; a well marked median band of small spots just beyond cell; discal and postdiscal bands formed of spots of nearly uniform size but no discal spot in 6; submarginal lunules 1c-5 well marked, those in 6 and 7 absent; a tuft of long fine hairs on abdominal fold. Ciliae brown, inconspicuous.

Underside.—Fore wing with reddish markings extended, partly confluent, the black ground-colour reduced; outer margin rufous-brown. Hind wing rather light rufous-brown, often dusted with greyish; markings faint, a brown median line being generally the most prominent; in some examples a postdiscal series of small brown rings centred with whitish becomes visible.

♀. Upperside as in ♂, but markings a little broader; hind wing without tuft on inner margin but with a red marginal line beyond the submarginal lunules and often partly fused with them.

Underside.—Fore wing as in ♂ but with a white spot on costa before apex and some greyish scaling beyond. Hind wing darker brown but much more extensively varied with pale grey, especially on basal and postdiscal areas; a dark spot in cell; postdiscal ring-spots distinct; generally a prominent whitish submarginal lunule in 3.

Habitat.—Jamaica, Rio Grande Valley, Cuna-Cuna Pass, St. Thomas, Fish River, Moore Town, Castleton. Very local but common where it occurs, chiefly at low elevations. Dated specimens February, March, July, and November. Type in Brit. Mus.

In *P. proclea* the acicular terminal joint of the palpi is prominent even to the naked eye, being very slender and clothed only with very short hairs. The brush-like tuft of hairs on the hind wing of the ♂ arises from vein 1a a little way beyond its junction with 1b, and is directed distad, the hairs being much longer in proportion than in *Prepona* and *Agrias*, reaching nearly to the hinder angle when lying flat against the wing.

Male genital armature widely different from that of the *tharos*

group. Valve (plate iii, fig. 9) rather narrow, the apex rounded and furnished with a number of small wart-like protuberances from which short hairs arise; a short, claw-like process just below apex and a long, curved process at about two-thirds of the distance from the base, both strongly chitinized. Uncus short but well developed, terminating in a point which, viewed ventrally, resembles the prow of a boat. Saccus with two lobes. Aedoeagus with a highly peculiar opening at the end.

24. *P. pelops* Drury.

Pap. pelops Drury, *Ill. Ex. Ent.*, i, t. 19, f. 3, 4 (1773); *Phyc. pelops*, Kirby, *Syn. Cat.* p. 174, n. 41 (1871); Röh. in Seitz' *Macrolep.*, v, p. 437, t. 89, f. F.8, 9 (1913).

(a) *Pap. aegon* Fabr., *Spec. Ins.* ii, p. 130, n. 574 (1781); *Phyc. aegon* Röh. in Seitz' *Macrolep.*, v, p. 437 (1913).

= *Argynnis pygmaea* Godt., *Enc. Méth.* ix, p. 290, n. 63 (1819).

= *Erycina aedon* Godt., l.c. p. 587, n. 111 (1823).

= *Melitaea anacoana* Herr.-Schäff., *Corresp. Regensb.*, 1844, p. 162, n. 18.

P. pelops pelops Drury.

Exp. 18—22 mm.

♂. Upperside very similar to *P. proclea* Doubl. and Hew. but on the fore wing there is a complete postdiscal series of six red spots and no white dot on the costa. Hind wing with a similar tuft of long hairs on abdominal margin.

Underside as in *P. proclea* ♂.

♀. Differs from the ♂ in the hind wing having no tuft on inner margin and being more varied with pale grey and dark brown beneath, the submarginal lunule in ♂ being whitish and prominent, the others faintly marked.

Habitat.—St. Kitts (type); Porto Rico; Hispaniola.

A rare species or else generally overlooked on account of its small size. Drury gave St. Kitts as the locality, and there are single specimens from that island in the British Museum and the Tring Museum, so that it is probably to be found also in some of the other Lesser Antilles. The British Museum also contains three ♂♂ one ♀ from Hayti and a pair from San Domingo.

(a) *P. pelops aegon* Fabr.

Exp. 15—20 mm.

♂, ♀. Only differs from *P. pelops pelops* in being smaller on an average and in the hind wing beneath being more varied with ashy-grey in both sexes.

Habitat.—Jamaica, Blue Mountains (800 feet); Cuba, Santiago, Panama, Rio Cano.

Dated specimens February, March and December.

This race is only feebly separated from *pelops pelops* and I can detect no difference at all between Jamaican and Cuban specimens. It is the smallest of all Nymphalidae.

The existence of two such closely allied species as *P. proclea* and *P. pelops aegon* together in Jamaica is curious. It is possible that *P. proclea* represents an earlier immigration of *P. pelops* which has had time to develop into a species, whilst *P. pelops aegon* is a later arrival which has scarcely become a subspecies.

25. *P. miriam* Dogn.

P. miriam Dogn., *Le Naturaliste*, 1888, p. 67; *ibid. Lep. de Loja* (2), p. 37, t. 3, f. 2 (1891).

Exp. 24—28 mm.

♂. Upperside dark brown. Fore wing with a fine bluish-white submarginal line, slightly sinuate. Hind wing with a postdiscal series of four bluish-white rings centred with black; two fine bluish-white submarginal lines, obsolete anteriorly.

Underside light ochraceous. Fore wing with faint traces of yellow-brown transverse lines, a more or less sinuate submarginal line being the best marked. Hind wing with fine yellow-brown linear markings, a postdiscal series of brown dots, and a submarginal series of outlined lunules of the ground-colour.

Habitat.—Ecuador, Loja.

Type in the Hill Museum, Witley.

Agrees with *P. fasciata* Hopff. in shape and on the under surface, but the upperside is quite unlike any other species. Apparently very local, as Dognin's specimens, about a dozen in number, are the only ones so far recorded."

26. *P. amazonica* Bates.

Melitaea amazonica Bates, *Journ. Ent.*, ii, p. 190, n. 10 (1864); *Phyc. amazonica* Staud., *Ex. Schmett.* i, p. 91, t. 36 ♀ (1888); Rüb. in Seitz' *Macrolep.*, v, p. 435, t. 89, f. B. 8, 9 (1913).

Exp. 33—40 mm.

♂. Upperside fulvous; markings black. Both wings with a marginal border 3 mm. wide, broadening to 6 mm. at costa of fore wing; both with some fine black lines at base, and median and discal series of small linear spots. Fore wing a submarginal fulvous spot in the black border in 3 (sometimes incompletely separated from the ground-colour), and sometimes others in 2 and 4. Hind wing discal spots in 1c-3 lunular; a postdiscal series of very small black dots; a submarginal series of thin fulvous lunules, sometimes all obsolete.

Underside dull pale ochreous with markings of upperside lightly but clearly reproduced in brownish, the transverse lines more regular and continuous. Fore wing with indistinct postdiscal dots. Hind wing postdiscal dots more distinct; pale submarginal lunules larger, more uniform in size.

♀. Very similar to ♂ but upperside paler and a little more heavily marked with black; both wings with a complete submarginal series of pale lunules.

Habitat.—Upper and Lower Amazon, Para, Parintins, Rio Papajoz, Serpa, Manaos, Fonteboa, Pebas, Rio Javary, Rio Napo. Type in Brit. Mus.

Nearest to *P. liriopae liriopae* Cram. but wings rounder and fore wing without the black subapical band. Bates has already pointed out that in neuration it departs from the usual pattern of the genus in the first subcostal branch of the fore wing being given off beyond the end of the cell.

Although widely distributed it is quite a rare species, seldom more than two or three examples coming from the same locality, and during four months collecting on the Lower Amazon in 1914 I did not meet with it at all. Specimens from the Upper Amazon, from Manaos upwards, are a little more heavily marked with black than those from the Lower Amazon, so that there may be two feebly separated subspecies, but I have not seen sufficient material to be certain on the subject. The type came from the Rio Papajoz. Seitz's fig. is very good and represents the Upper Amazon form.

Male armature at once distinguishable from that of *P. liriopae* by

the uncus (plate iii, fig. 3) being furnished with triple hooks as in *P. vesta*. Saccus with a single, rather broad, oblong projection.

27. *P. liriopae* Cram.

Pap. liriopae Cram., *Pap. Ex.*, i, t. 1, f. C.D. (1775); *Dryas reticulata liriopae* Hüb., *Samml. Ex. Schm.*, i, t. 40, f. 1-4 (1806-16); *Melitaea liriopae* Bates, *Journ. Ent.*, ii, p. 188 (1864); *Phyc. liriopae* Staud., *Ex. Schm.*, i, p. 91 (1888); Rüb. in Seitz' *Macrolep.*, v, p. 435, t. 89, f. A. 1, 2 (1913).

(a) *Acraea claudina* Esch., in Kotzebue's *Reise* iii, p. 212, t. 8, f. 18 a, b (1821); *Phyc. claudina* Staud., *Ex. Schm.*, i, p. 191 (1888); Rüb. in Seitz' *Macrolep.*, v, p. 435, t. 89, f. A. 3-5 (1913).

= *Argynnis flavia* Goat., *Enc. Méth.* ix, Suppl., p. 818 (1823); *Phyc. flavia* Staud., *Ex. Schm.*, i, p. 91 (1888).

(b) *Eresia orobia* Hew., *Ex. Butt.* iii, *Eresia*, t. 4, f. 23, 24 (1864); *Phyc. orobia* Rüb. in Seitz' *Macrolep.*, v, p. 435, t. 89, f. B. 8 (1913).

(c) *Pap. thymetus* Fabr., *Mant. Ins.* ii, p. 30, n. 320 (1787).

= *Melitaea fragilis* Bates, *Journ. Ent.*, ii, p. 189 (1864); *Phyc. fragilis* Staud., *Ex. Schm.*, i, p. 91 (1888); Rüb. in Seitz' *Macrolep.*, v, p. 435, t. 89, f. A. 9 (1913).

= *Eresia claudina* var. Hew., *Ex. Butt.*, iv, *Eresia*, t. 7, f. 52, 53 (1868).

(d) *Melitaea pastazena* Bates, *Journ. Ent.*, ii, p. 189, note (1864); *Phyc. pastazena* Rüb. in Seitz' *Macrolep.*, v, p. 435, t. 89, f. B. 4 (1913).

(e) *Mel. fragilis* var. *guatemalena* Bates, *Journ. Ent.* ii, p. 189 (1864).

= *P. guatemala* Rüb. in Seitz' *Macrolep.*, v, p. 435, t. 89, f. B. 2, 3 (1913).

= *P. fragilis* Godm. & Salv., *Biol. Cent.-Am. Rhop.* i, p. 198, t. 21, f. 23 (1882).

(f) *Eresia anieta* Hew., *Ex. Butt.*, iii, *Eresia*, t. 6, f. 43, 44 (1864); *Phyc. anieta* Godm. and Salv., *Biol. Cent.-Am. Rhop.* i, p. 197, t. 21, f. 20 (1882); Rüb. in Seitz' *Macrolep.*, v, p. 435, t. 89, f. A. 8 (1913).

= *P. flavia* Rüb. (non Godt.), in Seitz, l.c., p. 435, t. 89, f. A. 6 (1913).

= *P. flavina* Rüb. in Seitz, l.c. p. 435, t. 89, f. A. 8 (1913).

(g) *P. lirina* Rüb. in Seitz, l.c. p. 435 (1913).

P. liriopae liriopae Cram.

Exp. 30—38 mm.

♂ ♀, Upperside fulvous; markings black. Fore wing costa dusted with blackish; several fine black lines across cell and basal part of 1b; apex and outer margin black; disc crossed by an oblique black band, extending from costa to hinder angle, cutting off a broad preapical band of the fulvous ground-colour; this preapical band is often more or less completely divided into two parts by a black line, the anterior portion then consisting of three confluent subcostal spots and the posterior portion of two postdiscal and one or two submarginal spots more or less fused together. Hind wing scaled blackish at base; a black marginal border 3-4 mm. wide, marked with a submarginal series of fulvous lunules, the anterior ones generally obsolete; in some examples there is a postdiscal series of blackish dots or thin lunules internal to the marginal border.

Underside dull pale ochraceous. Fore wing with black markings of upperside faintly indicated in brownish. Hind wing with fine brown or rufous-brown linear markings, often faint or quite obsolete; in the more strongly marked examples there are linear subbasal marks, a curved median line, a postdiscal series of dots, and outlined submarginal lunules of equal size.

♀. Similar to ♂, but a little paler, the black markings above of a slightly brownish tone.

Habitat.—Surinam (type); British Guiana; French Guiana; Upper and Lower Amazon; Brazil; Bolivia; N.W. Argentina.

P. liriopae is the most widely distributed, most abundant, and most variable species of the whole genus. The composite species ranges from Mexico to Argentina, being as a rule abundant in all localities and at all seasons. The principal forms are well figured by Seitz, only the fig. named *flavia* on his plate belongs to *anieta*, and *fragilis* is synonym to *thymetus*. Unlike most species, the protean forms of *P. liriopae* vary considerably in size as well as in markings, and they are puzzling from the fact that in some places two forms, a large and a small one, fly together with only very occasional intergrades, so that at first sight they give the impression of two different species, but when specimens from many localities are compared, the most extreme forms will be found to be connected by all intergrades. In some districts two forms fly in localities a few miles apart, each remaining fairly true to its own type, whilst in other places much variation is found in specimens from

the same spot, and in others again one form remains very constant. After examining many hundreds of specimens in collections and still more on the wing in different parts of Central and South America, the only definite conclusion I have been able to form is that size is to a large extent governed by altitude, the smallest forms being met with at high elevations and the largest in the low-lying plains near the equator. Although most of the following forms are imperfectly separated geographically, and in some cases curiously distributed, they are all, except *f. orobia* Hew., distinctly *dominant* in certain districts, and we are therefore justified in treating them as subspecies. *P. liriopae liriopae* is the largest form and has the broadest black borders. The type came from Surinam, and although the figure is not one of Cramer's best, it agrees sufficiently well with the large form prevalent in the three Guianas. Dated examples January, February, April, June, July, December. Specimens from the Lower Amazon (Para in January and February, Santarem in March, Igaripe-Assu in November, &c.) may also be regarded as typical, although they are a little lighter and less heavily marked than those from Guiana. The same form, either alone or accompanied by others, occurs at various localities on the Upper Amazon as far as Peru, where it gradually merges into other forms, some specimens from Chanchamazo, Pozzuzo, &c., being as large as *liriopae liriopae* but with the markings of *liriopae thymetus*. Specimens similar to the large form of the Lower Amazon are abundant, strange to say, in N.W. Argentina (Sierra de Aconquija in February, Salta in March), but throughout Central and South Brazil this form only seems to occur as an occasional aberration.

(a) *P. liriopae claudina* Esch.

Exp. 25-38 mm.

♂ ♀. Considerably smaller on an average than *liriopae liriopae*. Upperside paler fulvous, often yellowish, fore wing black, marginal border narrower; black subapical band in typical examples entire, sharply defined; fulvous preapical band generally distinctly divided by a black line; hind wing with little or no blackish scaling at base; marginal border not more than half as wide as in *liriopae liriopae*, the fulvous submarginal lunules absent or imperfectly separated from the ground colour; postdiscal dots minute or absent. Underside on the whole more feebly marked than in *liriopae liriopae* but dark subapical band of fore wing sometimes heavier; hind wing nearly always with

small white linear spots on outer margin; occasionally the whole outer area clouded with purplish-brown.

Habitat.—Central and South Brazil; Uruguay; Paraguay; Argentina.

Throughout Central and South Brazil, Uruguay and Paraguay, *P. liriopae claudina* is the prevalent, and in most localities the only form, specimens from such localities as Bahia, Tijuca, Bello Horizonte, Ponta Grossa, Santa Catharina, Rio Grande do Sul and Buenos Ayres showing no local or season differences, although many specimens are transitional to *P. liriopae thymetus*. *P. flavia* Godt. is best taken as synonym. In Central Argentina, from Buenos Ayres to the Cordoba Hills, *liriopae claudina* is the only form, but in the Sierra de Aconguija at 1,500-2,000 feet, and near Salta at 3,000 feet I found it accompanied by numerous specimens inseparable from the Amazonian form of *liriopae liriopae*, the two forms here being so well separated that among hundreds of specimens I was only able to pick out about a dozen intergrades.

(b) *P. liriopae claudina* f. *orobia* Hew.

♂ ♀. Upperside as in *liriopae claudina* but the outer part of fulvous preapical band of fore wing divided into from 3 to 5 spots; black subapical band heavy; hind wing with distinct black postdiscal spots internal to the marginal border. Underside of hind wing more or less marked with purplish-brown in discal area.

Habitat.—Brazil; Paraguay; Argentina. Type in British Museum. This is only an occasional aberration. The type is without locality, but very similar specimens are known to us from Para, Novo Friburgo, Barbacena, Paraguay and Buenos Ayres. Some examples have on the fore wing from 3 to 6 small fulvous apical spots beyond the preapical band and on the outer margin of hind wing beneath a large purplish-brown patch from which a streak extends to the base of the wing; such specimens have a superficial resemblance to *P. ursula* Staud. A short description of the early stages of *liriopae claudina* is given in Seitz.

(c) *P. liriopae thymetus* Fabr.

♂ ♀. Size of *liriopae claudina* but fore wing a little narrower. Upperside pale fulvous or yellowish, fore wing dusted blackish on costa to beyond discocellulars; black subapical band obsolete or entirely wanting, the fulvous preapical band, which is thus fused with the

ground colour, not divided by a black line; black marginal border narrow, widening to 3 mm. at costa, often with a slight projection at or near vein 3. Hind wing and underside as in *liriope claudina*.

Habitat.—Northern Brazil, Amazons, Guiana, Trinidad, Venezuela (pro parte); Colombia (ab.).

The figure of *thymetus* in Jones's *Icones* agrees sufficiently well with the type of *P. fragilis* Bates for the latter to be sunk as synonym. According to Bates this form entirely replaces *liriope liriope* on the Rio Cupari. On the Amazon and in Guiana it occurs in company with the commoner *liriope liriope*, and I have also seen specimens from Pernambuco, Trinidad, the Guiria Peninsula of Venezuela, and Suapure on the Orinoco. In Colombia it is found as an occasional aberration, and in other parts of Venezuela (San Esteban, Caracas) it is found frequently in company with the there dominant *P. liriope anieta*.

(d) *P. liriope pastazena* Bates.

Size of *liriope claudina* but fore wing more pointed. Upperside deeper fulvous; fore wing black subapical band thin or obsolete; fulvous preapical band entire; marginal border moderately wide, deep black, even hind wing marginal border narrow, without any trace of submarginal lunules. Underside a little darker than in *claudina*.

Habitat.—Ecuador, Colombia. Type from Canelos, in British Museum. Also occurs in Western Ecuador at Huigra (4,000 feet). In Central Colombia I took at La Mesa (4,000 feet, May and June) a form closely resembling *pastazena* accompanied by a few examples transitional to *thymetus*; but in West Colombia, at Crystalina (1,100 feet) and San Rafael (3,500 feet) there was flying a considerably different form with more elongate wings, approaching *guatemalena* but with broader black borders.

(e) *P. liriope guatemalena* Bates.

♂ ♂. Shape and pattern of *liriope thymetus* but fore wing often with little or no black scaling on costa, and outer marginal border still narrower, becoming linear towards hinder angle; hind wing marginal border as narrow as in *thymetus* or narrower, often linear or obsolete.

Habitat.—South Mexico, Guatemala, Honduras. Type in British Museum. Some specimens of this race cannot be distinguished from *liriope thymetus*, but the more typical examples differ in the characters given above, and are the most scantily marked of all forms of *P. liriope*.

In the ♀♀ however the dark subapical band of fore wing is generally more or less distinctly indicated in brownish. There are also specimens with the markings like *thymetus* but with the fore wing short and pointed, as in *pastazena*. Very pale yellow examples of both sexes seem to be more frequent than in the other races.

Flies throughout the year but less abundant in the dry season; from sea level up to 5,000 feet. The most northern locality recorded is San Blas in Mexico and the most southern San Pedro Sula in Honduras.

(f) *P. liriopae anieta* Hew.

Exp. 20—32 mm.

♂ ♀. The smallest of all forms of *P. liriopae*. Upperside rather bright fulvous. Fore wing base and costal margin rather heavily blackish; subapical black band in typical specimens heavy and entire, but in others thin or interrupted at the middle; marginal border broad, deep black, not narrowed posteriorly; fulvous preapical band rather small. Hind wing with a little black scaling at base; marginal border rather heavy, sharply defined, without pale lunules. Underside a little more strongly marked than in *liriopae claudina*.

Habitat.—Guatemala, Polochic Valley; Nicaragua; Costa Rica; Chiriqui; Venezuela (type in Brit. Mus.); Peru; Bolivia. This form is the prevailing, and frequently the only one in many localities in Venezuela and Costa Rica and is often very abundant. In Venezuela I have taken it from sea-level (Puerto Cabello) up to 8,000 feet on the Silla of Caracas, specimens from the latter locality being extremely small. A very long series of examples from Costa Rica do not differ at all from those from Venezuela, but examples from Guatemala, where it is scarce and apparently confined to the Polochic Valley, are very dark, approaching the following form. Specimens from various localities from Peru and Bolivia were named *flavina* by Röber, but do not seem to differ from *anieta* in any constant character.

(g) *P. liriopae lirina* Röb.

♂ ♀. Size and pattern of *liriopae anieta*, but base and costa of fore wing more broadly blackish than in any of the other forms of *liriopae*; preapical band divided by a black line and followed by a submarginal spot in ♂; hind wing distinctly blackish at base; marginal border as broad as in the darkest examples of *anieta*, sometimes with fulvous lunules.

Habitat.—Bolivia, Chulumani (8,000 feet), Rio Unduare (2,800 metres). The male armature of *P. liriopae* (pl. iii, fig. 22) and the other species of this group (*P. tissoides* and *P. fontus* not examined) shows more similarity to that of the mimetic species of the section *Eresia* than to that of the *tharos* group, inasmuch as the uncus is expanded at the end and furnished with two small spinose lobes. The saccus has a single projection, which in *P. liriopae* is rather longer than in *P. amazonica*. The claw-like process at the tip of valve is longer in *P. liriopae liriopae* than in most specimens of *P. liriopae guatemalensis* and *P. liriopae anieta*, but there is some variation in this character.

28. *P. nazaria* Feld. (pl. i, fig. 12, ♂).

Eresia nazaria Feld., *Reise Nov. Lep.*, iii, p. 394, n. 581 (1867);
Phyc. nazaria Rüb. in Seitz' *Macrolep.*, v, p. 439 (1913).

= *P. mazaria* Kirby, *Cat.*, p. 172, n. 6 (1871).

= *P. aquila* Hall, *Entomologist*, 1917, p. 162.

Exp. 30—35 mm.

♂ ♀. Size and general pattern of *P. liriopae liriopae* Cram., but on the upperside the base of fore wing is solidly black to beyond the end of the cell, with only a single small fulvous discoidal spot; the marginal border is also more broadly and deeply black and generally contains a small additional postdiscal spot in 1b; the fulvous preapical band is distinctly divided into four spots, one being the submarginal spot in 3, which is rarely obsolete. Hind wing, basal third blackish; marginal border broader and blacker than in *P. liriopae liriopae*, the fulvous submarginal lunules 1b to 3 distinct, the others absent.

Underside hardly differing from *P. liriopae liriopae*, but the brownish median line of hind wing, when developed, is bent more distad.

The ♀ is a little larger than the ♂ but not otherwise different.

Habitat.—Colombia, Bogota (type), Fusagasuga (coll. Brit. Mus.), El Baldio (5,400 feet, coll. Hall). Type in Tring Museum. Apparently a mountain species of some rarity.

It further differs from all forms of *P. liriopae* in the hind wing, having a slight bulge or projection in the middle of the outer margin, a character already noticed by the acute eye of Felder.

Valve less narrowed apically than in *P. liriopae*; uncus and saccus quite similar.

29. *P. cluvia* Godm. and Salv.

P. cluvia, Godm. and Salv., *Biol. Cent. Am. Rhop.*, i, p. 198, t. 21, f. 21, 22 (1882); Rüb. in Seitz' *Macrolep.*, v, p. 435 (1913).

Exp. 26—28 mm.

♂. Upperside very similar to *P. liriopae anieta* Hew. but the fulvous ground-colour a little deeper and the black markings broader. Fore wing base and costal margin broadly black, reducing the fulvous discal area to an almost circular patch; black subapical band broad; fulvous preapical band divided into two parts by a black line, the distal part represented by two contiguous spots; faint traces of a fulvous submarginal spot in 3. Hind wing rather broadly black at base; marginal border broader than in *P. liriopae anieta*, with a fulvous submarginal line from hinder angle to vein 4.

Underside as in *P. liriopae anieta*, but hind wing and outer margin of fore wing brownish, much darker than in any of the forms of *P. liriopae*; subapical band of fore wing blacker and heavier.

Habitat.—Guatemala, Cerro Zunil (type, in Brit. Mus.), Volcano of Santa Maria (5,000 to 6,000 feet), Purula.

This interesting species seems to bear much the same relationship to *P. liriopae anieta* as *P. nazaria* Feld. does to *P. liriopae liriopae*. It is a scarce insect, of which I have only seen two ♂♂ in the British Museum, three in the Tring Museum, and six in coll. Hall, the latter taken in October. The female is unknown.

30. *P. etia* Hew.

Eresia etia Hew., *Ex. Butt.*, iv, *Eresia*, t. 7, f. 56, 57 (1868); *Phyc. etia* Rüb. in Seitz' *Macrolep.*, v, p. 445, t. 90, f. G. 1 (1913).

(a) *P. etia selenoides* Hall, *Entomologist*, vol. lxi, p. 11 (1928) (Peru).

(b) *Eresia tissa* Hew., *Equat. Lep.*, p. 27, n. 49 (1869).

(c) *P. selene* Rüb., in Seitz' *Macrolep.*, v, p. 445, t. 90, f. F 7, 8 (1913).

P. etia etia Hew.

Exp. 27—30 mm.

♂ ♀. Upperside blackish-brown. Fore wing with a large fulvous discal patch in 1 b-3 and, contiguous with it, a broad fulvous bar at anterior end of cell; an oblique subapical band of the same colour from vein 4 to costa, sometimes continued obscurely below vein 4; a small

tawny median spot in 1 b, another in cell, and a tawny line on discocellulars, all sometimes obsolete. Hind wing immaculate or with a few tawny scales in median area; occasionally there are traces of a pale submarginal line.

Underside: Fore wing rather light brown at base and outer margin; disc blackish; fulvous markings as above but paler, the distal end of discal patch sometimes separated into a small round spot in 1 b; a fine brown submarginal line. Hind wing brown, varied with ashy-grey and marked with fine lines of darker brown as in *P. liriopae*; a post-discal series of small brown spots bordered by darker colour, a fine brown submarginal line and sometimes linear white marginal spots.

Habitat.—Ecuador (type in Brit. Mus.). Peru: Chachamayo (3,000-4,000 feet), El Porvenir (2,800 feet), Huancabamba (6,800 feet), Maracapata, Pozuzo, San Remon (3,000 feet), Rio Colorado, La Merced (2,500 feet), Perene. Bolivia: Yungas de la Paz, Chulumani, Bueyes, Charaplaya.

Dated specimens, April, June, August, September, October.

P. etia is a species which varies even more in size and pattern than the allied *P. liriopae*. The typical race is, however, fairly constant in South Peru and Bolivia, but in some examples the hind wings are suffused with tawny above and have a postdiscal series of tawny rings. The ♀ is similar to the ♂ but a little larger.

(a) *P. etia selenoides* Hall (pl. i, fig. 4, ♂).

♂. Size of *P. etia etia* or slightly larger; wings a little rounder. Upperside: Markings deep tawny, reduced. Fore wing discal patch 1b-3 broken into two spots, the proximal one simple, narrow, placed immediately below cell-bar and contiguous with it, the distal one larger, trifid, more or less rounded; subapical band abbreviated, not extending below vein 4; no postdiscal or submarginal spots. Hind wing with a small, often very indistinct band beyond cell. Underside as in *P. etia etia*.

Habitat.—Peru, Chachapoyas. Type and seven ♂♂ paratypes in British Museum.

This form cannot be considered a true subspecies as *P. etia tissa* is known from the same locality; it is, however, of very great interest in linking *P. etia etia* with the entirely black *P. etia tissa* on the one hand and also with the large and brightly coloured *P. etia selene* on the other.

(b) *P. etia tissa* Hew.

Size of *P. etia etia*. Upperside blackish-brown entirely without markings or with faint traces of tawny scaling in the disc.

Habitat.—Ecuador: Mapota (type in Brit. Mus.), Huigra (3,000 feet), Balsapamba; Peru: Chachapoyas.

This highly melanic form seems to be constant in certain localities, but it is scarce in collections. I took specimens at Huigra in February.

(c) *P. etia selene* Rüb.

Exp. 30—35 mm.

♂ ♀. Considerably larger than *P. etia etia*; the wings broader, fore wing fulvous, discal patch smaller in proportion, rounder, the cell-bar narrower; subapical band continued below vein 4, but the part lying in cellule 3 separated as a spot and the distal part of the sections lying in 4 and 5 also more or less separated. Hind wing with fulvous median band 3—5 mm. wide, extending from inner margin to vein 7; sometimes an indistinct submarginal line.

Underside as in *P. etia etia* but on fore wing the dark band crossing the disc is generally more brownish.

Habitat.—Colombia, Cañon de Tolima (5,200 feet); Ecuador: El Topo (4,200 feet), Sarayacu, Alpayacu (3,600 feet), Santa Inez, Rio Verde (5,000 feet). Peru: Rio Tabaconas (6,000 feet). Type, from Cañon de Tolima, in Tring Museum. Extreme specimens of this form have at first sight the appearance of being a different species, but an interesting series of intergrades in the Hill Museum, at Witley, shows that *P. etia etia* and *P. etia selene* are related to one another in much the same way as the large and small forms of *P. liriopae*.

Male armature of *P. etia etia* of the same type as in *P. liriopae*; uncus, when viewed laterally, straighter; the dorsal surface less indented.

31. *P. tissoides* Hall (pl. i, fig. 1 ♂).

Entomologist, lxi, p. 11 (1928) (Ecuador).

Exp. ♂ 28 mm.; ♀ 32 mm.

♂. Size and shape of *P. etia etia* Hew.

Upperside uniform blackish-brown, entirely without markings.

Underside: Fore wing dark-brown; base dusted with yellowish-white to beyond end of cell; a very indistinct submarginal lunulated line of darker brown bordered by some yellowish-white atoms. Hind wings

yellowish-white, shading to brown near anterior angle and on outer margin, some fine linear brown marks on basal area; across the middle of the wing two fine, irregular, parallel dark-brown lines, the inner one just beyond end of cell, the outer one about 3 mm. more distal; a lunulated submarginal line, obsolete anteriorly. Thorax and abdomen whitish beneath.

♀ similar to the ♂ but larger.

Habitat.—Ecuador: Angamarca, Salidero (350 feet, February).

Type ♂, allotype ♀ and one ♂ co-type in British Museum, one ♂ co-type in the Tring Museum. A most interesting species, resembling *P. etia tissa* Hew. in its unicolorous blackish upper surface, but the underside is not much like that of any other known form.

32. *P. nigrella* Bates.

Melitæa nigrella Bates, *Ent. Mo. Mag.*, iii, p. 133 (1866); *Phyc. nigrella* Godm. and Salv., *Biol. Cent. Am. Rhop.*, i, p. 199, t. 21, f. 24—26 (1882); Rüb. in Seitz' *Macrolep.*, v, p. 444, t. 88, f. 18 (1913).

(a) *P. lutescens* Godm. and Salv., *Biol. Cent. Am. Rhop.*, i, p. 199 (1882); Rüb. in Seitz' *Macrolep.*, v, p. 444 (1913).

? = *P. drusinilla* Rüb. in Seitz' *Macrolep.*, v, p. 441, t. 90, f. A 8 (1913).

(b) *P. niveonotis* Butl. and Druce, *Cist. Ent.*, i, p. 100 (1872); *ibid.*, *Proc. Zool. Soc.*, 1874, p. 348; Godm. and Salv., *Biol. Cent. Am. Rhop.*, i, p. 200 (1882); Seitz' *Macrolep.*, v, p. 441, t. 90, f. A 7 (1913); Schaus, *Proc. Zool. Soc.*, 1913, p. 346, t. 53, f. ten ♀.

P. nigrella nigrella Bates.

Exp. ♂ 25—30 mm; ♀ 32 mm.

♂. Upperside black; markings pale clay-yellow, often obscured by fuscous. Fore wing, a large trifold, generally more or less rounded discal spot in 1B—3 and a preapical band represented by three small confluent spots near costa and two others placed rather wide apart in 4 and 5. Hind wing a fairly broad discal band commencing at vein 1B and terminating at or before costal margin, its outer edge often excised at vein 4. Underside, fore wing black in disc, greyish at base and outer margin, with fine brown lines; markings as above but better defined, the discal blotch larger; a waved brown submarginal line. Hind wing pale grey with fine brown lines, blackish postdiscal dots and linear white spots on outer margin; pale band of upperside scarcely indicated.

♀. Similar to ♂ but larger, the markings of upperside more clearly defined.

Habitat.—Guatemala: San Geronimo (type in British Museum), Cerro Zunil, Las Nubes, La Antigua, Volcano of Santa Maria.

Rather scarce at elevations of 3,000—5,000 feet. Dated examples July and October. The type specimen has the markings much obscured, somewhat as in Seitz's fig., but the latter is not good, the discal spot of fore wing being shown in the wrong position. Most specimens have the markings lighter and clearer.

(a) *P. nigrella f. lutescens* Godm. and Salv.

♂. Similar to *nigrella nigrella* except that the markings above are clear pale yellow and more sharply defined.

♀. Pale yellow markings above broader than in the ♂, the discal spot of fore wing and band of hind wing slightly fulvous at the edges; the fore wings have also an ill-defined submarginal fulvous spot in 3 and the hind wing thin submarginal fulvous lunules in 1 B—3.

Habitat.—Guatemala, Purula (type in British Museum), San Cristobal. Apparently only an extreme variation of *nigrella nigrella* but it is a little-known form of which I have seen only two pairs, one in the British Museum, the other in my own collection. The latter, from San Cristobal, were taken in November and December. The insect figured by Seitz as *P. drusinilla* Rüb. seems to belong here, but the locality is given as Argentina!

(b) *P. nigrella niveonotis* Butl. and Druce.

♂. Similar to *nigrella lutescens*, but the markings above are pure white. Underside also more whitish.

♀. White discal spot of fore wing larger than in ♂, finely edged with fulvous; a fulvous submarginal spot in 3. Hind wing discal band finely edged with fulvous distally; a fulvous submarginal line. Underside of hind wing darker than in the ♂, the white discal band of upperside more or less distinctly reproduced.

Habitat.—Costa Rica, Juan Viñas (2,500 feet), Cache, Navarro. Type in British Museum.

Dated specimens January, March, October, December.

Uncus of *P. nigrella niveonotis* a little shorter and broader than in *P. liriopae*, but the armature otherwise quite similar.

33. *P. flavida* Hew.

Eresia flavida Hew. *Ex. Butt.*, iv, *Eresia*, t. 7, f. 61 (1868);

Ph. flavida Rüb. in Seitz' *Macrolep.*, v, p. 444 (1913).

= *P. albescens* Rüb. in Seitz, l.c., p. 444, t. 90, f. F 4 (1913).

Exp. 28—32 mm.

♂, ♀. Upperside yellowish-white. Fore wing costal margin dusted with fuscous to beyond end of cell; a broad black marginal border about 5 mm. wide at costa, narrowing to 2 mm. at hinder angle. Hind wing with black marginal border not more than 2 mm. wide; sometimes thin submarginal lunules in 1 B—3.

Underside yellowish-white. Fore wing with fine submarginal brownish line. Hind wing with feebly marked brown striae and post-discal dots.

Habitat.—Ecuador: Angamarca, Huigra (4,000 feet), Zamora, Quevedo; Northern Peru. Type in British Museum.

Allied to *P. liriopae fragilis* Bates, but distinguished from it and all allied forms by its white ground colour. A rare species of which I have only seen about a dozen specimens. My single Huigra example, a ♀, was taken in February. The sexes are quite alike.

34. *P. fontus*, Hall (pl. ii, fig. 2, ♂).

Entomologist, vol. lxi, p. 11 (1928) (British Guiana.)

Exp. 28 mm.

♂. Upperside black; markings very pale ochraceous. Fore wing with narrow, oblique discal band from inner margin to base of cellule 3, two small spots above it in 4 and 5, and a small postdiscal spot in 4. Hind wing with narrow discal band; no postdiscal or submarginal line.

Underside: Fore wing ochraceous-fulvous with pale ochraceous markings as above; an additional postdiscal spot in 5; a fine, lunulate dark brown submarginal line. Hind wing ochraceous; band of upperside indicated in paler colour; a postdiscal series of small black spots and a submarginal series of blackish lunules.

Habitat.—British Guiana. Type one ♂ in the Hill Museum at Witley.

A curious little species which perhaps ought to be placed in a group by itself. The upperside has a certain superficial resemblance to *P. nigrella* Bates, but the shape of the wings agrees better with *P. pusilla* Salv. than with the *liriopae* group.

35. *P. teletusa* Godt.

Argynnis teletusa Godt., *Enc. Méth.*, ix, Suppl., p. 817, n. 64 (1823);
Phyc. teletusa Rüb. in Seitz' *Macrolep.*, v, p. 438 (1913).

(a) *P. teletusa signata* Hall, *Entomologist*, vol. lxi, p. 11 (1928)
 (Argentina).

(b) *P. teletusa* subsp. *boliviana* Rüb. in Seitz' *Macrolep.*, v, p. 438
 (1913).

(c) *Eresia berenice* Feld., *Wien. Ent. Mon.*, vi, p. 110, n. 78 (1862);
Phyc. berenice Rüb. in Seitz' *Macrolep.*, v, p. 438, t. 89, f. I, 1 (1913).

(d) *P. burchelli* Moul., *Ann. Mag. Nat. Hist.*, 1909, p. 100; Rüb. in
 Seitz' *Macrolep.*, v, p. 438 (1913).

= *P. teletusa* subsp. *peruana* Rüb. in Seitz, l.c. p. 438, t. 89, f. H 7
 (1913).

= *P. teletusa* Seitz (non Godt.), *Macrolep.*, v, t. 89, f. H 5, 6,
 (1913).

P. teletusa teletusa Godt.

Exp. ♂ 27-35 mm.; ♀ 35-38 mm.

♂. Upperside black; markings fulvous. Fore wing without spots in cell or only an obscure one at apex; discal spots 1b and 3 small, contiguous with the rather large spot in 2, forming a somewhat transverse blotch; discal spots 4-6 quite small, contiguous; postdiscal spots 1b and 2 absent or fused with discal blotch; a small postdiscal spot in 4 and a submarginal spot in 3 just below it. Hind wing discal band fairly broad, continuous, distinctly broader anteriorly; postdistal line absent or only a fragment present posteriorly; submarginal lunules very thin or obsolete, except that in 7, which is always present and thicker than the rest.

Underside: Fore wing yellow-brown on basal half, blackish in disc, brown at apex and outer margin; discal spots as above but those in 1b-3 sometimes ill-defined owing to fusion with the basal area; above the postdiscal spot in 4 two small whitish subcostal spots followed by a black dot in 5; submarginal spot 3 large, and above it three or four small lunules, sometimes whitish, bordered distally by a dark brown line. Hind wing yellow-brown with a more or less broad dark brown shade on distal area; some faint brown subbasal lines; pale band of upperside indistinctly reproduced; a postdiscal series of dark brown dots and a submarginal series of greyish lunules.

♀. Like ♂ but slightly paler, the thin submarginal lunules of hind wing above better marked.

Habitat.—Central and South Brazil: Novo Friburgo, Rio Janeiro, Sao Paulo, Castro and Uniao da Victoria in Parana, Santa Catharina, Santa Maria in Rio Grande do Sul; Paraguay: Sapucay.

Dated specimens January, March, November, December.

Rather local but common where found. At Uniao da Victoria I met with it in great abundance in December and January, settling in swarms in damp places. In an aberrant ♀ from that locality the band of the hind wing is white except anteriorly.

Seitz' fig. does not represent the typical form.

(a) *P. teletusa signata* Hall.

♂ ♀. Differs from all the other subspecies in the fore wing having a prominent transverse spot at each end of cell. Wings a little more rounded than in *teletusa teletusa*; markings paler, more ochreous; discal band of hind wing not widened anteriorly; the thin submarginal lunules on an average more distinct; discal blotch 1b—3 of fore wing beneath generally separated from yellow-brown basal area by a thin edging of black.

Habitat.—N.W. Argentina: Salta (3,300 feet), Sierra de Aconquija (1,500-2,500 feet), Metan (2,500 feet), Catamarca, Sierra de Tortoral, Rioja. Type from Salta in coll. Hall.

Dated specimens January to April.

(b) *P. teletusa bolivianna* Rüb.

♂ ♀. Intermediate between *P. teletusa teletusa* and *P. teletusa berenice*. Fore wing more rounded than in *teletusa teletusa*; cell-spot small or absent; discal blotch 1b—3 broader; postdiscal spot in 4 sometimes inclined to coalesce with discal spot in same interspace. Hind wing discal band more uniform than in *teletusa teletusa*, broader posteriorly but not widened anteriorly; postdiscal line 1b—4 generally present.

Underside a little paler than in *teletusa teletusa*, but not materially different.

Habitat.—Bolivia: Chulumani, Coroico, Quito, Carabaya (7,000 feet), Charaplaza. Peru: Maracapata (4,500 feet).

A rather unstable form, some Bolivian specimens agreeing better with the following race, whilst a single example from Maracapata, Peru in the Tring Museum distinctly belongs to *bolivianna*. Dated specimens May and June.

(c) *P. teletusa berenice* Feld.

♂ ♀. Fore wing more rounded than in any of the other races; cell-spot absent or very small; discal blotch 1b—3 narrow, but sometimes continued to inner margin; above the postdiscal spot in 4 there are often from 1 to 3 subcostal dots, and in some examples from 2 to 5 thin submarginal lunules are present. Hind wing discal band narrower than in any of the other races, not widened anteriorly; postdiscal line 1b—4 generally present; submarginal line distinct.

Underside: Basal area of fore wing a little darker than in *teletusa teletusa*; otherwise similar.

Habitat.—Rio Negro (type in Tring Museum). Ecuador: Santa Ines. Peru: Chanchamayo (4,000 feet), Uruhuasi (7,000 feet), La Merced, Perene, Huancabamba, Huayabamba. Bolivia: Coroico, Bueyes.

Dated specimens January, March, April, May to September, all from Peru. Examples from Ecuador have the discal blotch 1b—3 of fore wing narrower and more band-like than those from Peru and the submarginal lunules more distinct. Felder's type, which was said to be from the Rio Negro, agrees with Ecuador specimens. Seitz' fig. represents the Peru form and is good.

(d) *P. teletusa burchelli* Moulton.

♂ ♀.—Wings narrower than in any of the other races; markings brighter yellowish. Fore wing discal blotch taking the form of a broad band from inner margin to vein 3; postdiscal spot in 4 sometimes fused with discal spots 4—6, so as to form an oblique preapical band. Hind wing discal band twice as broad as in *teletusa teletusa*, a little wider anteriorly; postdiscal line absent or fragmentary.

Habitat.—Brazil: Chapada and Nivac in Matto Grosso, Goyaz. Bolivia: Reyes, Santa Cruz de la Sierra, Rio Beni. Peru: Rio Colorado (2,500 feet), San Remon, La Merced, Pozzuyo, Rio Perene, Nanta. Ecuador: Rio Napo, Archidona.

Dated specimens January, February, April to August, all from Peru.

It is remarkable that the two most extreme forms of *P. teletusa* should both occur in the same districts of Peru, but from the data available it seems that *berenice* is found only at elevations of over 4,000 feet, and has probably been derived from the mountains of Bolivia, whereas *burchelli* is confined to the low-lying Amazonian valleys running up from Matto Grosso, in which state the most broadly-banded examples are found. Seitz' figs. of *teletusa* and *peruana* both seem to

represent *burchelli*. Valve of *P. teletusa teletusa* (pl. iii, fig. 19) narrower than in most allied species, the process at apex boot-shaped; the usual thorn-like process below apex rather thicker than in *P. frisia*. Saccus with two projections. Uncus (pl. iii, fig. 29) without lobes, narrow.

The armature of *P. teletusa burchelli* is quite similar. According to the form of the valve the species would come near to *P. jana* Feld. and *P. trimaculata* Hew.

36. *Prima* sp. nov.

Exp. 36 mm

♂. Allied to *P. teletusa* Godt. but the wings longer and narrower than in any of the forms of that species. Upperside dark brown; markings pale testaceous as in *P. orthia* Hew. Fore wing with narrow discal band, scarcely 2 mm. wide, extending from inner margin to vein 4; three small, contiguous subcostal spots in 4-6; two postdiscal spots in 3 and 4. Hind wing with narrow, entire discal band scarcely 2 mm. wide, and beyond its anterior end two small fulvous spots imperfectly separated from it; no postdiscal or submarginal line.

Underside as in *P. teletusa* Godt. but much paler and more feebly marked.

Habitat.—Surinam, interior (C. W. Ellacombe). Type in Tring Museum.

This may be another subspecies of *P. teletusa* Godt. but the wings are produced almost as much as in *P. dicoma* Hew.

37. *P. faustus* Godm. and Salv.

P. faustus Godm. and Salv., *Trans. Ent. Soc.*, 1897, p. 243; *ibid.*, *Biol. Cent. Am. Rhop.*, ii, p. 680, t. 108, f. 19, 20 (1901); Rüb. in Seitz' *Macrolep.*, v, p. 441 (1913).

Exp. 30 mm.

♂. Upperside very similar to *P. teletusa berenice* Feld., but fore wing with a prominent fulvous spot at end of cell; discal spots 1b-3 forming a somewhat oval blotch, spots 4-6 larger than in *berenice*; no postdiscal spots; a fairly large submarginal spot in 3 and two smaller ones above it. Hind wing discal band fairly broad, entire; no postdiscal line; submarginal lunules thin, obscure, that in 7 heavier.

Underside: Fore wing yellow-brown from base to end of cell, with some brown lines in cell; disc fuscous with fulvous spots as above and 3 or 4 small whitish subcostal spots in postdiscal area; a complete

submarginal series of whitish lunules, that in 3 larger; outer margin brown. Hind wing basal half brownish-white with a number of yellow-brown subbasal spots; disc brownish, with black postdiscal dots; a complete submarginal series of whitish lunules of uniform size; outer margin light brown.

Habitat.—Panama, Chiriqui. Type in Berlin Museum. The above description is taken from the figure, as I have not come across a specimen. It may be a Central American representative of *P. teletusa*, but the under surface, which is not mentioned at all in the original descriptions, seems to have characters of its own.

38. *P. orthia* Hew. (pl. i, fig. 5, ♀).

Eresia orthia Hew., *Ex. Butt.*, iii, *Eresia*, t. 4, f. 21, 22 (1864); *Phyc. orthia* Rüb. in Seitz' *Macrolep.*, v, p. 438, t. 89, f. H 8-10 (1913).

= *P. poltis* Godm. and Salv., *Ann. Mag. Nat. Hist.* (5), ii, p. 261 (1878); *ibid. Biol. Cent.-Am. Rhop.*, i, p. 200, t. 21, f. 28, 29 (1882); Rüb. in Seitz' *Macrolep.*, v, p. 438, t. 88, f. I 3!! (1913).

= *P. orthia ab. evanescens* Rüb. in Seitz, l.c. p. 438 (1913).

Exp. ♂ 30—35 mm.; ♀ 35—40 mm.

♂. Wings somewhat broader than in *P. teletusa* Godt. Upperside black-brown; markings pale testaceous and fulvous. Fore wing, a transverse testaceous spot at end of cell; sometimes two or three small fulvous spots in basal part of cell and others in 1 b below cell; discal spots pale testaceous, spots 1 b and 3 small and contiguous with the fairly large spot in 2, spots 4-6 small, contiguous; a round testaceous postdistal spot in 1 b well separated from discal spots; two smaller postdistal spots in 4 and 5, generally fulvous, sometimes obsolete; a submarginal fulvous spot in 3, rarely with a smaller one above it. Hind wing, discal band pale testaceous, entire as far as vein 4, where it more or less abruptly changes to fulvous, this anterior portion sometimes being separated into two spots; no postdistal line; submarginal lunules thin or absent.

Underside: Fore wing yellow-brown from base to middle, disc blackish, apex and outer margin brown; markings as above but pale yellowish; the large submarginal spot in 3 and 2 or 3 small ones at apex the only ones distinct; a small white postdiscal spot below costa and a wavy brown antemarginal line. Hind wing, basal area whitish-grey with a network of fine brown lines; discal band indistinctly reproduced in whitish; outer area brown, with the usual black postdiscal dots; submarginal lunules greyish-white, those in 2-4 almost always overclouded with brownish.

♀. Larger than ♂, somewhat paler, hind wing above with a complete series of rather heavy submarginal lunules and a fragment of a postdiscal line.

Habitat.—Southern Brazil: Castro and Ponta Grossa in Parana, Lages in Santa Catharina, Santa Maria and Porto Alegre in Rio Grande do Sul; Paraguay, Sapucay; Argentina, Corrientes.

Type in British Museum. Dated specimens November to January.

A fairly common and rather variable species, recognizable by the band of hind wing being of a deeper colour anteriorly. Seitz's two figs of the upperside both represent ♂♂, not ♂♀ as stated on the plate, and give a good idea of the individual variation. In some specimens the markings are almost whitish and the outer spots of both wings tend to vanish (*ab. evanescens* Rüb.). At Santa Maria I took a remarkable aberration in which the black ground-colour is largely replaced by fulvous. As in most species of this group, the underside is much more constant than the upper surface.

P. poltis Godm. and Salv., based on a specimen erroneously said to have come from Mexico, is an absolute synonym, the type closely agreeing with the type of *orthia*, but Seitz's fig. of *poltis* on plate 88 is monstrous.

Valve of the usual type, with two short claw-like processes at apex. Uncus without hooks or spines. Saccus single, the projection blunt.

39. *P. velica* Hew.

Eresia velica Hew., *Ex. Butt.*, iii, *Eresia*, t. 4, f. 25, 26 (1864); *Phyc. velica* Rüb. in Seitz' *Macrolep.*, v, p. 438 (1913).

= *P. sejona* Schaus, *Proc. U. S. Nat. Mus.*, xxiv, p. 392 (1902); Rüb. in Seitz' *Macrolep.*, v, p. 438, t. 89, f. 1 2, 3 (1913).

(a) *P. durnfordi* Godm. and Salv., *Ann. Mag. Nat. Hist.* (5), ii, p. 263 (1878).

— *P. velica subsp. dictynna* Rüb. in Seitz' *Macrolep.*, v, p. 238, t. 89, f. K 5-7 (1913).

P. velica velica Hew.

Exp. ♂ 27—32 mm.; ♀ 32—36 mm.

♂. Form and general pattern of *P. orthia* Hew. but markings above tawny. Fore wing, a transverse spot at end of cell and several small spots in basal part of cell and 1 b; discal spots 1 b-3 contiguous, widely separated from spots 4-6; postdiscal spots 1 b and 2 placed close to the

discal spots, generally partly or wholly fused with the discal spots; small postdiscal spots in 4 and 5, and a rather large submarginal spot in 3, sometimes with small ones above and below it. Hind wing discal band nearly twice as wide as in *P. orthia* Hew., entire, extending into outer end of cell; no postdiscal line; submarginal lunules obscure or obsolete, those in 1 b-3 the most frequently present.

Underside: Fore wing base dark yellow-brown, disc blackish, apex and outer margin rufous-brown; markings as above but yellowish; an ashy-grey preapical spot on costa; a dark brown submarginal line. Hind wing light rufous-brown varied with ashy grey; an irregular brown median line, a submarginal waved line, and blackish postdiscal dots.

♀. Larger than ♂, a little paler; submarginal lunules of hind wing more distinct.

Habitat.—Brazil: Rio Janeiro, Sao Paulo, Castro in Parana, Santa Catharina, Rio Grande do Sul. Type in Brit. Mus. A rather scarce form. The only dated specimens I have seen were taken in July and August. In typical examples the markings are of a distinctly reddish tint, but with them there occur also specimens like those figured by Seitz as *P. sejona*, in which the spots are of a more fulvous tone and therefore better defined.

(a) *P. velica durnfordi* Godm. and Salv.

♂, ♀. Upperside with markings deeper reddish-tawny and greatly reduced. Fore wing in some examples with all the spots of *velica velica* present but smaller, in others the spots partly or wholly obsolete. Hind wing with discal band represented at most by a spot in the cell, another beyond it, and two small spots in 5 and 6, sometimes all obsolete.

Underside as in *velica velica* but a little darker.

Habitat.—Brazil: Castro, Iguassu Falls; Uruguay: Concepcion; Paraguay: Sapucay; Argentina: Buenos Ayres, Belgrano, San Thomé in Misiones, Entre Rios, Salta. Type in British Museum. This interesting melanic race occurs as an aberration in some parts of Brazil but is a constant subspecies in Argentina. In extreme examples, chiefly ♂♂, the upper surface is without any markings whatever, and specimens with the hind wings entirely black are common. Dated examples January, February, April, May, October.

Male armature of *P. velica velica* very similar to that of *P. orthia*.

40. *P. frisia* Poey.

Melitaea frisia Poey, *Cent. Lep. Cub.*, p. 9, t. 2 (1833); *Phyc. frisia* Godm. and Salv., *Biol. Cent.-Am. Rhop.*, i, p. 203 *pro parte* (1882); *Eresia frisia* Holland, *Butt. Book*, p. 157 (1898); *Phyc. fresia* Rüb. in Seitz' *Macrolep.*, v, p. 437, t. 89, f. E 7 ♀ (1913).

= *Eresia gyges* Hew., *Ex. Butt.*, iii, *Eresia*, t. 6, f. 45, 46 (1864).

(a) *Melitaea tulcis* Bates, *Ent. Mo. Mag.*, i, p. 82, n. 37 (1864); *Phyc. tulcis* Godm. and Salv., *Biol. Cent.-Am. Rhop.*, i, p. 203, t. 22, f. 1, 2 (1882); *ibid.*, l.c., p. 681 (1901); *Skinn. Cat.*, p. 18 (1898); Rüb. in Seitz' *Macrolep.*, v, p. 441, t. 90, f. B 8, C. 1 (1913).

= *Eresia archesilea* Feld., *Verh. Zool. Bot. Geo.*, 1869, p. 471.

= *E. punctata* Edw., *Trans. Am. Ent. Soc.*, 1871, p. 191; Holland, *Butt. Book*, p. 158, t. 17, f. 39 (1898).

(b) *P. frisia dubia* subsp. nov.

= *P. frisia* Godm. and Salv., *Biol. Cent.-Am. Rhop.*, i, p. 203 (p.p.), t. 22, f. 6 (1882); Seitz' *Macrolep.*, v, 89, f. E 6 (1913).

(c) *P. taeniata* Rüb. in Seitz, l.c., p. 438, t. 89, f. H 3, 4 (1913).

P. frisia frisia Poey.

Exp. ♂ 25—32 mm, ♀ 35, 37 mm.

♂. Outer margin of fore wing only slightly excavated below vein 4. Upperside black-brown; markings pale fulvous, inclining to yellowish. Fore wing, several small spots in cell and a transverse spot at end; in 1b two or three small subbasal spots and a rather prominent median spot; discal spots 1b and 3 small (the former often double) and contiguous with the larger spot in 2, spots 4—6 rather large, contiguous; postdiscal spot 1b large, round, often with a smaller one above it in 2, spots 4 and 5 small but well marked, followed by one or two subcostal dots; a fairly large submarginal spot, quadrate or lunular, in 3 and generally a smaller one in 2. Hind wing with rather large fulvous subbasal spots, separated by black lines; a median series of fulvous spots forming a short band widest at costa and narrowing almost to a point at vein 1b; discal band rather narrow, entire, the black band distal to it generally more or less macular; postdiscal line broader than in any other species of the group, band-like, entire; submarginal lunules rather large, all distinct.

Underside: Fore wing yellow brown from base beyond end of cell, disc blackish, apex and outer margin rufous-brown; markings as above but pale yellow, the two subcostal dots in postdiscal area often white;

submarginal lunules 2 and 3 at the most well marked, the rest obsolete ; a dark brown submarginal line. Hind wing brownish white with fine brown linear markings ; distal area more or less shaded with brown, and often a brownish shade at middle of costa ; discal band indistinctly marked in whitish ; the usual blackish postdiscal dots ; submarginal lunules rather faint.

♀. Similar to ♂ but larger, the hind wing beneath a little darker and more strongly marked.

Habitat.—Cuba ; Jamaica ; Hispaniola ; Porto Rico ; Bahamas ; Florida, Key West.

Generally common throughout the year at low elevations in the Greater Antilles, whence it has spread to Key West in Florida, and Sir Gilbert Carter has taken it at Nassau in the Bahamas. Records of *P. frisia* from Central and South America almost certainly refer to one of the following subspecies ; there are two examples of *frisia frisia* in the British Museum labelled "Honduras," but these came from a collection containing many errors of locality. Seitz's fig. of the ♂ represents *frisia dubia*, but his fig. of the ♀ is good, and that of Hewitson, under the name of *E. gyges*, is also recognizable.

Larva, according to a specimen preserved in the Tring Museum, covered with short spiny processes, with two slightly longer ones on the 1st segment ; the original colour appears to have been dull green or brownish but has faded.

(a) *P. frisia tulcis* Bates.

♂, ♀. Upperside with all markings very pale ochraceous. Fore wing marked as in *frisia frisia* but subbasal spots less prominent and the small postdiscal spot in 2 hardly ever present. Hind wing subbasal spot much reduced ; median spots absent or represented by two linear marks near costa ; discal band better defined owing to the black band distal to it being solid ; postdiscal line absent or represented by a thin fragment posteriorly, seldom extending beyond vein 4 ; submarginal lunules thin in the ♂, heavier in the ♀.

Underside much paler than in *frisia frisia*. Fore wing basal area ochraceous, spots almost whitish. Hind wing less shaded with brown on distal area, the submarginal lunules more prominent.

Habitat.—S.W. United States : Texas, Arizona, New Mexico. Mexico : Sierra Madre de Tepic, Tampico, San Blas, Ciudad Victoria, Ventanas, Cuantla, Cordoba, Orizaba, Atoyac, Vera Cruz, Valladolid in Yucatan, Teapa. Guatemala : Puerto Barrios, Quirigua, San Geronimo.

Zapote: Polochic Valley, Amatitlan, Palin, Santa Maria, Escuintla. Honduras: San Pedro Sula, Ruatan, Tela. Salvador: Santa Tecla, San Agustin. Nicaragua: Chontales, Matagalpa. Costa Rica: Puntarenas, Turrialba. Panama: Empire, Monte Lirio, Calobre. Type, from Guatemala, in British Museum.

A very common species in Mexico and Central America from sea level up to nearly 5,000 feet. Dated specimens February, June, July, August, September, October, December. Seitz's figures are good.

(b) *P. frisia dubia* subsp. nov.

♂, ♀. Intermediate between *frisia frisia* and *frisia tulcis*. Upperside: markings deeper ochraceous than in *frisia tulcis* but paler than in *frisia frisia*. Fore wing as in *frisia tulcis* but the small postdiscal spot in 2 often present. Hind wing subbasal spots as prominent as in *frisia frisia*; median spots present in 5-7; postdiscal line fairly heavy, complete, broken into linear spots; submarginal lunules heavier than in *frisia tulcis*.

Underside as in *frisia tulcis* but a trifle darker.

Habitat.—Panama (?); Colombia: Barranquilla, Valle Dupar, Manaure, Sierra de Santa Martha. Venezuela: Valencia, Puerto Cabello, El Pilar, Carupano, Margarita Island. Type, from Puerto Cabello, in British Museum.

This form is figured in the "Biologia" as *P. frisia*, from a specimen labelled "Panama." It may possibly begin to appear in that country, but all specimens taken by me in the Panama Canal Zone belong to *frisia tulcis*. In Venezuela and the coast districts of Colombia, however, *frisia dubia* is common and very constant; I found it abundant at Puerto Cabello in September.

(c) *P. frisia taeniata* Rüb.

♂, ♀. Upperside with all markings light fulvous as in *frisia frisia*. Fore wing similar but spots a little larger, particularly the postdiscal spot in 2, which is as large as that in 1b; in addition to the submarginal spot in 3 there are generally linear spots in the other interspaces. Hind wing as in *frisia frisia* but the black bands sometimes even narrower.

Underside as in *frisia frisia* but paler, the markings not so well defined.

Habitat.—Ecuador: Guayaquil, Loja. Peru: Tarapoto (type), San Marcos, Viña (5,500 feet).

The reversion of this form towards the typical race from the Antilles is interesting. The Loja specimens in the British Museum were taken in December. Uncus of *P. frisia frisia* and *P. frisia tulcis* formed somewhat as in the *P. tharos* group but slightly spinose outside; valve of the usual shape. Saccus with two projections.

41. *P. drusilla* Feld.

Eresia drusilla Feld, *Wien. Ent. Mon.*, v, p. 103, n. 79 (1861); *Phyc. drusilla* Staud., *Ex. Schmett.*, i, p. 92 (1888); Rüb. in Seitz' *Macrolep.*, v, p. 441 (1913).

= *P. flavimacula* Rüb. in Seitz, l.c. p. 442, t. 90, f. C 2 (1913).

(a) *Melitaea lelex* Bates, *Ent. Mo. Mag.*, i, p. 82, n. 35 (1864); *Phyc. lelex* Stand., *Ex. Schmett.*, i, p. 92 (1888); Rüb. in Seitz' *Macrolep.*, v, p. 443 (1913).

= *P. ptolyca* Godm. and Salv. (non Bates), *Biol. Cent.-Am. Rhop.*, i, p. 201 (pro parte), t. 21, f. 34 (1882); Seitz' *Macrolep.*, t. 90, f. B 2-4 (1913).

(b) *Melitaea alethes* Bates, *Ent. Mo. Mag.*, i, p. 82, n. 36 (1864); *Phyc. alethes* Rüb. in Seitz' *Macrolep.*, v, p. 443 (1913).

= *Mel. stesilea* Bates, *Ent. Mo. Mag.*, i, p. 82, n. 37 (1864); *Phyc. stesilea* Rüb. in Seitz' *Macrolep.*, v, p. 442 (1913).

= *P. ptolyca* Gordon and Salv. (non Bates), *Biol. Cent.-Am. Rhop.*, i, p. 201 (pro parte), t. 21, f. 35, 36 (1882).

= *P. lelex* Seitz' *Macrolep.*, v, t. 90, f. D 4 (1913).

(c) *Eresia alceta* Hew., *Equat. Lep.*, p. 28, n. 50 (1869).

= *P. flavimacula* subsp. *conflua* Rüb. in Seitz' *Macrolep.*, v, p. 442 (1913).

(d) *Eresia verena* Hew., *Ex. Butt.*, iii, *Eresia*, t. 4, f. 27, 28 (1864); *Phyc. verena* Rüb. in Seitz' *Macrolep.*, v, p. 440, t. 90, f. A 1 (1913).

P. drusilla drusilla Feld.

Exp. ♂ 30—38 mm. ♀ 35—44 mm.

♂. Fore wing truncate at apex, rather deeply excavated below vein 4. Upperside black-brown: markings fulvous. Fore wing spot at apex of cell small, round or transverse, sometimes double; sometimes a small tawny spot near base of cell; a small but well-marked median spot in 1b and often a less distinct spot near base of same interspace; discal spots 1b and 3 very small, contiguous with the spot in 2, spots 4-6 contiguous with one another but well separated from spot in 3;

postdiscal spot 1b fairly large, round; another round postdiscal spot, slightly smaller, in 4, and two subcostal dots above it; a small submarginal spot in 3 always present, and often linear spots above and below it in 2 and 4. Hind wing often with 1-3 small tawny subbasal spots and more rarely tawny median spots in 5 and 6; fulvous discal band about 2 mm. wide, entire, extending from vein 1b-6; postdiscal line slender but distinct, generally extending at least to vein 4, often to 5 or 6; submarginal lunules slender but generally all present, that in 7 never thicker than the rest.

Underside: Fore wing black; markings much as above but pale yellow; cell and basal part of 1b almost wholly yellowish, divided into spots by black lines, the middle cell-spot darker than the rest, often yellow-brown; apex and outer margin rufous-brown, often yellowish in 2-4; the two subcostal dots above postdiscal spot in 4 white, sometimes a third present; submarginal lunules 2-4 generally distinct, the others obsolete, except two small ones at apex which are whitish, all bordered distally by a dark brown line. Hind wing very variable, pale yellow, more or less clouded and varied with rufous-brown and whitish-grey; on the basal area a number of ill-defined spots outlined in brown; an irregular, dark brown median line; pale discal band of upperside more or less distinctly reproduced in yellowish, sometimes whitish in specimens in which it is very narrow; a postdiscal series of blackish-brown dots, rarely indistinct, submarginal lunules of uniform size, yellowish or whitish-grey, often all obscured with brown except the two at anterior angle.

♀. Very similar to ♂ but larger, markings above a little paler, more yellowish. Fore wing, the two small subcostal spots near apex better marked, white or yellowish; nearly always three submarginal spots present, 2-4. Hind wing tawny, subbasal spots sometimes better developed.

Underside as in ♂.

Habitat.—Venezuela: Caracas (type), El Encanto, Valencia, Puerto Cabello, San Esteban, Mérida, Valera. Colombia: Muzo, La Mesa, Cauca Valley, Rio Dagua, Rio San Juan, San Pablo, Popayan. Ecuador: Rio Pastazza, Balsapamba, Huigra, Paramba, Cachabe, El Porvenir. Panama. Type in Tring Museum. Dated specimens February, May, June, July, August, September, October, November. I have given a rather lengthy description of *P. drusilla drusilla* because it will be necessary to describe a number of other forms and species by comparison with it. The composite species is the most widely distributed,

commonest and most variable of its group, ranging in different forms from Mexico to Bolivia and flying throughout the greater part of the year at elevations from sea level up to at least 6,000 feet. Herr Röber, in Seitz, has treated the *drusilla* forms as no less than seven different species, but all are connected by intergrades and some are imperfectly separated geographically. All specimens from Venezuela, Colombia and Western Ecuador may be referred to *drusilla drusilla*, although they exhibit a fair amount of individual variation, especially on the underside of the hind wing. *P. flavimacula* Rüb. was founded upon specimens from West Colombia in which the spots are rather larger than usual, but this form has no local constancy; I have similar examples from Mérida, Venezuela and from Panama. In the same districts there occur also small specimens with the markings reduced, these being perhaps a product of dry periods.

(a) *P. drusilla lelex* Bates.

♂, ♀. Markings above quite similar to *drusilla drusilla* but paler, ochraceous. Underside of hind wing pale yellowish or whitish with the usual markings but the pale discal band and dark postdiscal spots always distinct; pale submarginal lunules also distinct except those in 4 and 5, which are clouded with brown.

Habitat.—Panama: Lion Hill, Monte Lirio, Chiriqui. Guatemala: Puerto Barrios, Quirigua. British Honduras: Sarstoon River. Mexico: Tapachula, Guerrero.

Type, from Panama, in British Museum.

(b) *P. drusilla aethes* Bates.

♂. Markings above varying from light fulvous to ochraceous, always paler than in *drusilla drusilla*. Fore wing with only one small, sometimes indistinct submarginal spot. Hind wing, postdiscal line obsolete or abbreviated, never extending beyond vein 4; submarginal lunules sometimes obsolete anteriorly.

Underside of hind wing darker than in any of the other forms, heavily marked with russet or rufous-brown, the pale discal band thin and macular or completely obscured; submarginal lunules generally all indistinct.

♀. Larger than ♂, paler, the markings always ochreous. Fore wing generally with a small submarginal spot in 2 as well as in 3. Hind wing submarginal lunules a little thicker; subbasal spots, when present, smaller and paler than in *drusilla drusilla*.

Habitat.—Mexico : Cordoba, Orizaba, Omealca, Teapa. Guatemala : Dueñas (type in British Museum), Polochic Valley, Tucuru, Escuintla, Moran, Palin, La Antigua, Volcano of Santa Maria, Amatitlan. Honduras : San Pedro Sula. Costa Rica : Juan Viñas, Siquirres, Turrialba, Guapiles, Cache.

Dated specimens, all months except March and April. *P. drusilla lelex* and *P. drusilla alethes* might perhaps be regarded as extreme forms of one Central American race, but whereas the former, the name of which would take priority, is prevalent only in Panama and a few localities in Eastern Guatemala, the latter is unquestionably the dominant form in most districts and in Western Guatemala is almost the only form.

In Mexico *alethes* is comparatively rare and *lelex* still rarer. Costa Rican specimens are for the most part intermediate between *drusilla alethes* and *drusilla drusilla*. Seitz' figs., named *P. ptolyca* on Plate 90, are *lelex*, and his fig. of the underside named *lelex* is *alethes*; his fig. of the upperside of *lelex* is not sufficiently good to determine what form it belongs to. *P. stesilea* Bates is the female of *alethes*.

(c) *P. drusilla alceta* Hew.

♂, ♀. Upperside as in *drusilla drusilla*, but on the fore wing discal spots 4 and 5 are enlarged so as to become contiguous and spot 1b is continued to inner margin, the discal spots thus forming a complete band across the wing. Underside of fore wing differing as above. Hind wing as in *drusilla drusilla*.

Habitat.—Ecuador : Rio Verde (type), Curarai. Peru : La Merced, Rio Colorado, Chanchamayo, Perene. Type in British Museum. The Adams collection at the British Museum contains some interesting intergrades between *drusilla drusilla* and *drusilla alceta*.

(d) *P. drusilla verena* Hew.

♂. Discal spots of fore wing united to form a continuous band as in *drusilla alceta* but the band broadened posteriorly so as to coalesce with postdiscal spot 1b. Hind wing discal band twice as broad as in the other races of *P. drusilla*, extending to, and absorbing, the post-discal line. Hind wing beneath as in paler examples of *drusilla drusilla*.

Habitat.—Bolivia, Reyes.

Type in British Museum.

This race seems to be very rare. Besides the type I have only seen one specimen, a ♂ in the Tring Museum, from Reyes on the Rio Beni. The fig. in Seitz represents an intergrade between *drusilla alceta* and *drusilla verena*.

Value of *P. drusilla drusilla* (pl. iii, fig. 10) and *P. drusilla alethes* of the usual pattern, with two short claw-like processes at the tip. Uncus, when viewed dorsally, somewhat conical, the sides slightly crenulate, the end without hooks or spines. Saccus with two moderately long projections.

42. *P. ardys* Hew.

Eresia ardys Hew., *Ex. Butt.*, iii, *Eresia*, t. 5, f. 35, 36 (1864); *Phyc. ardys* Butl. and Druce, *Proc. Zool. Soc.*, 1874, p. 348; Godm. and Salv., *Biol. Cent.-Am. Rhop.*, i, p. 204, t. 22, f. 4, 5 (1882); *ibid.*, l.c. ii, p. 681 (1901); Rüb., in Seitz' *Macrolep.*, v, p. 442, t. 90, f. D 2 (1913).

= *Eresia geniguch* Reak., *Proc. Ent. Soc. Phil.*, ii, p. 225 (1865).

= *P. hermas* (Godm. and Salv. (non Hew.), *Biol. Cent.-Am. Rhop.*, i, p. 204 (1882).

(a) *P. subota* Godm. and Salv., *Proc. Zool. Soc.*, 1878, p. 268; *ibid.*, *Biol. Cent.-Am. Rhop.*, p. 204, t. 22, f. 7, 8 (1882); Rüb. in Seitz' *Macrolep.*, v, p. 443 (1913).

P. ardys ardys Hew.

Exp. ♂ 28—35, mm., ♀ 35—42 mm.

♂, ♀. Similar to *P. drusilla alethes* Bates but markings above white or yellowish-white (rarely ochraceous in the ♂) and reduced. Fore wing above with median spots 1 b and 3 quite minute or altogether absent, so that spot 2 is more isolated. Hind wing discal band narrower than in *drusilla alethes*, macular, broken into spots by the veins; post-discal line and submarginal lunules as in *drusilla alethes*.

Underside entirely as in *drusilla alethes* except that the spots of fore wing are whiter.

Habitat.—Mexico: Cordoba (2,500 feet), Orizaba (4,000 feet), Jalapa, Cuesta de Misantla, Omealca, Omilteme, Amula. Nicaragua: Matagalpa. Costa Rica: Juan Viñas (2,500 feet), Alihuela (4,200 feet), Cartago, Cache, Irazu. Type in British Museum.

Dated specimens March, June, July and November from Mexico, January, September, October and December from Costa Rica.

P. ardys subota Godm. and Salv.

♂, ♀. Larger than the average size of *P. ardys ardys*. Fore wing above similar but without any trace of pale subbasal spots. Hind wing also without pale subbasal spots; discal band broader, less macular; postdiscal line and submarginal lunules more or less obsolete.

Underside of hind wing more varied with whitish-grey; discal band pure white, prominent.

Habitat.—Guatemala: Polochic Valley (type in Brit. Mus.), Purula, Panima, Sinanja, Tucuru. Colombia: Rio Choco (form. non. typ.). As *P. ardys* only differs from *P. drusilla aethes* in the markings being reduced and of a whitish colour its specific distinctness is by no means beyond doubt, but I have kept it separate owing to its puzzling distribution. In Mexico *P. ardys ardys* is very common and flies in company with *P. drusilla aethes*, which, whilst much rarer there, shows no signs of an approach towards *P. ardys*. There occur, however, in Mexico examples of *ardys* having the fore wing a little more produced, the spots purer white and the hind wing beneath more varied with whitish, and this form, which Godman and Salvin referred to *P. hermas*, is to some extent transitional to *ardys subota*. In Guatemala *ardys ardys* seems to be totally absent, but is replaced in a very limited area by *ardys subota*, which is very different to the forms of *P. drusilla* flying in that district. From Honduras and Nicaragua there is not sufficient material in collections to form any conclusions, but in Costa Rica we again find *P. ardys ardys* accompanied by *P. drusilla aethes* but without intergrades, the two species being there about equally common and some of the specimens of *ardys* being transitional to *ardys subota*. In West Colombia we again find *P. ardys* in a form very closely approaching *subota* and very different to the specimens of *P. drusilla* found there, whilst in the rest of Colombia, in Venezuela and in Ecuador where *P. drusilla* is abundant, there are no representatives of *P. ardys* at all. The relationship between the two species is a puzzle which can probably only be solved by breeding; at present we can only say definitely that *P. ardys* is neither a local nor a seasonal or elevation form of *P. drusilla*. The male armature shows no satisfactory differences.

43. *P. ptolyca* Bates.

Melitaea ptolyca Bates, *Ent. Mo. Mag.*, i, p. 81 (1864); *Phyc. ptolyca* Godm. and Salv., *Biol. Cent.-Am. Rhop.*, i, p. 201 (pro parte), t. 21, f. 32, 33 (1882).

= *P. carrera* Hall, *Entomologist*, 1917, p. 162.

(a) *P. ptolyca amator*, subsp. nov.

P. ptolyca ptolyca Bates (pl. i, fig. 6, ♂).

Exp. ♂ 25—32 mm.; ♀ 32—38 mm.

♂, ♀. Very similar to *P. drusilla alethes* Bates but smaller, the fore wing narrower. Upperside: Markings deep ochraceous as in *P. drusilla alethes*, but on fore wing the transverse spot at end of cell more prominent; on hind wing the postdiscal line entirely wanting or only represented by a short fragment posteriorly and the anterior submarginal lunule, in 7, always heavier than the rest, generally twice as thick.

Underside: Fore wing with yellowish basal area a little more extended, generally extending to and partly round discal spot 1b-3. Hind wing more varied with whitish-grey than in *drusilla alethes* and much more constant; discal band always whitish and prominent.

Habitat.—Mexico: Atoyac. Guatemala: Chisoy Valley (type in Brit. Mus.), San Geronimo, San Cristobal (4,000 feet), Guazacapan, Moran, Lake Amatitlan (3,700 feet). Nicaragua: Jinotega (3,200—4,200 feet).

Dated specimens January, February, July, August, September, October.

P. ptolyca was confounded by Godman and Salvin with the forms of *P. drusilla*, and this has caused much subsequent confusion. It is a smaller, more restricted and much rarer species which may be recognized by the characters given above, the most important being the enlargement of the submarginal spot at the anterior angle of hind wing above; when the submarginal lunules tend to become obsolete this spot is the last to go, whereas in *P. drusilla* it is the first. *P. ptolyca* has also a slightly different flight, so that I was generally able to pick it out from among the swarms of *P. drusilla alethes* with which it flies. All specimens from the neighbourhood of Lake Amatitlan, where I took a series of over thirty examples, are very small and have no trace of the postdiscal line of hind wing; this is the form which I described as *P. carrera*, but as similar specimens occur in other districts in company with typical *ptolyca* it can hardly be maintained as a subspecies.

(a) *P. ptolyca amator* subsp. nov.

♂, ♀. Markings above paler yellowish than in *P. ptolyca ptolyca* and reduced. Fore wing discal spots 1b and 3 absent, that in 2 smaller. Hind wing ferruginous subbasal spots more prominent; discal band narrower but not macular; postdiscal line absent; submarginal lunules thinner or obsolescent, the one at anterior angle less thickened but still noticeably heavier. Underside as in *ptolyca ptolyca*.

Habitat.—Western Mexico, Ventanas (2,000 feet), Venta de Zopilote (2,800 feet), Milpas (5,900 feet), Acaguizotla (3,000 feet), Los Amates (2,500 feet), Sierra Madre de Tepic. Type and 9 co-types in British Museum; 5 co-types in coll. Hall.

Dated specimens July and October.

This race has the same resemblance to *P. ardys* Hew. as *P. ptolyca ptolyca* has to *P. drusilla alethes*. In both races of *P. ptolyca* the uncus (pl. iii, fig. 4) appears to be a little longer than in *P. drusilla* and *P. ardys*, but the difference is by no means marked.

44. *P. cortes* Hall.

P. cortes Hall, *Entomologist*, 1917, p. 161.

Exp. ♂ 32-36 mm.; ♀ 45 mm.

♂, ♀. Closely allied to *P. ardys* Hew. with which it agrees in the shape of the wings, but the outer margin of both wings is more sinuate-dentate. Upperside almost as in *P. ardys* but markings pure white. Fore wing with two well-separated spots at end of cell; submarginal spot in 3 larger, clearer. Hind wing without postdistal line. Ciliae more broadly white between veins.

Underside: Fore wing paler yellow at base than in *P. ardys*; the two white spots at outer end of cell always well separated. Hind wing much paler, more yellowish than brownish; a prominent dark brown spot beyond discocellulars; submarginal lunules whitish-grey, less clouded with brown.

Habitat.—S. W. Mexico: Cuantla (4,000 feet). Type in coll. Hall. Also very similar above to *P. texana* Edw. but the fore wings are shorter, and on the underside it is easily distinguishable by the basal area of fore wing being much paler yellow, less extended and much less sharply defined.

The male genitalia show *P. cortes* to be quite distinct from *P. ardys* and *P. texana*, and much more closely related to *P. drymaea* Godm. and Salv. Valve (pl. iii, fig. 13) with two processes at apex, one of the usual short claw-like form, the other long and sickle-shaped; the usual long process below apex.

45. *P. drymaea* Godm. and Salv.

P. drymaea Godm. and Salv., *Proc. Zool. Soc.*, 1878, p. 268; *ibid.*, *Biol. Cent.-Am. Rhop.*, i, p. 205, t. 22, f. 9, 10 (1882); Rüb. in Seitz' *Macrolep.*, v, p. 442, t. 90, f. C7 (1913).

Exp. ♂ 28-35 mm. ♀ 40 mm.

♂. ♀. Form and pattern of *P. drusilla* Feld. but outer margin of fore wing a little more deeply excavated below vein 4. Upperside deep black; markings pure white, very small. Fore wing without subbasal spots; a small round spot at end of cell, rarely with a second one above it; median spot 1 b prominent; discal spots 1 b and 3 absent, that in 2 small and isolated; discal spot 4 also absent or represented by a minute dot; postdiscal spots 1 b and 4 small and round, with the usual one or two subcostal spots above the latter; submarginal spots all absent or that in 3 faintly indicated by a linear mark. Hind wing without subbasal spots; discal band represented by five small, widely separated spots; postdiscal line obsolete or faintly indicated in 1 b-3; submarginal lunules very thin or obsolete.

Underside: Fore wing black-brown; base but little paler, with the usual black lines; all white spots as above but a little larger; a small submarginal lunule in 3 and sometimes traces of others; apex and outer margin dark rufous-brown, irrorated with grey at apex. Hind wing darker brown than in any of the allied species except *P. sosis*, varied with ashy-grey and with the usual complicated markings; submarginal lunules greyish. The ♀ is larger than the ♂, and the hind wings beneath are a little paler.

Habitat.—Guatemala: Las Nubes (type, in Brit. Mus.), Calderas (7,000 feet), Purula (4,000 feet), Duenas, Polochic and Chisoy Valleys, La Antigua (5,800 feet), Volcano of Santa Maria. Honduras (teste Röber).

This species is remarkably constant, some forty specimens examined showing practically no variation. It is extremely local and not very common. Dated specimens July, August and October. Valve (plate iii, fig. 14) narrow, the apex with two processes, one short, the other very long and sharply bent into the form of a hook. Uncus without hooks or spines, the sides more deeply crenulate than in *P. ardy's* or *P. drusilla*.

ac . . .

(To be continued.)

CORRIGENDA.

(Vol. III, Part 1.)

- p. 32. line 12 from bottom, for p. 164 read p. 165.
" " 11 " " " p. 165 " p. 166.
p. 33, " 7 " " for "one ♂" read "ten ♂♂."
p. 46, " 3 for *N. xylmaria* read *x. xylmaria*.
" 5 for *N. leptometa* read *x. leptometa*.
p. 48, " 5 from bottom, for *xanthryala* read *xanthryala*.
pp. 54-55, for *cynis* read *cynis*.

ADDENDA.

(PART 1, pp. 18-19).

When the paper on the genus *Simplicia* went to the press it had unfortunately been overlooked that Swinhoe, in *Ann. Mag. Nat. Hist.* (9), iv, p. 122 (1919), has a note upon *Simplicia schaldusalis* and *marginata* (*Nabartha marginata* Moore), calling attention to the fact that they appear to him to be distinct species, though giving no clear differentiation. In this paper the name *moorei* is proposed for the apparently preoccupied name of *marginata*; but it has already been pointed out, that owing to the sinking of *Bocana marginata* Moore to *mistacalis* Guen., *Nabartha marginata* Moore can be allowed to stand. Strangely enough Swinhoe overlooked the important fact that *bimarginata* Walker is structurally quite distinct from *schaldusalis* Wlkr.; *marginata* Moore (which he erects as a species) is no more than a local race of *bimarginata*.

A. E. P.

NEW GEOMETRIDAE FROM THE WEYLAND MOUNTAINS (DUTCH NEW GUINEA).

BY LOUIS B. PROUT.

At the date of the publication of my paper entitled "New Geometridae from Dutch New Guinea and Mefor Island" (*Bull. Hill Mus.* i (3), pp. 456-476, 1924) several of the Geometrid novelties collected by the Pratt brothers during their highly successful collecting expedition to the Weyland Mountains had not been worked out. On the present occasion it is possible to add twelve others and there still remain a few which, on different grounds, it is considered desirable to suppress or hold over.

All the types and allotypes of the species and races described are in the Joicey collection.

Subfamily LAURENTIINAE.

1. *Desmochlystia cneocoplaca* sp. nov.

♂, 20 mm.

Head brown, the crown more buff. Palpus 1½, 2nd joint dark-mixed on outside, 3rd joint somewhat deflexed, buff. Antennal ciliation even, short (about half). Thorax and abdomen fuscous (brown mixed with fuscous-black), the abdomen with a brighter belt near its base and with the minute crests whitish-grey.

Fore wing with DC, partition of areole (= base of SC²) and proximal fork of SC¹ almost in a line; deep-brownish-drab, crossed, excepting in terminal area, by numerous (about ten) extremely fine and inconspicuous waved grey lines; an irregularly oval patch, from midcosta to base of R³-M¹, of a warm-buff-colour (really light-buff, clouded, especially in its anterior part, with cinnamon-buff); a minute costal patch of similar colour beyond; cell-dot very small, placed in the oval buff patch. Hind wing glossy light mouse-grey.

Fore wing beneath glossy light mouse-grey; costal margin cinnamon-buff; cell-dot faint; a fine postmedian line indicated in anterior half,

just proximal to the outer buff patch, oblique outward to R^1 , then vertical; traces of a median line at costa only. Hind wing less glossy grey, irrorated with brown, with indications of elongate cell-mark and wavy postmedian line.

Habitat.—Mount Kunupi, 6,000 feet, December, 1920, January, 1921, one ♂.

2. *Brubira mesoschides* sp. nov.

♀, 32 mm.

Face and palpus light brown. Vertex and thorax whitish. (Abdomen lost). Fore tibia blackened.

Fore wing with M^2 arising almost with M^1 , perpendicular at first, then curving very sharply; anterior part white, posterior part fawn-brown mostly obscured with irroration of a darker, greyer shade, the boundary between the colours running along M , DC and (less sharply defined) about R^3 ; the white part spotted with brown from base to beyond two-thirds, the subbasal and the last spot very small, four intervening ones large; faint traces of lines from the large ones; a very small black cell-spot; the dark part not very solid, largely irrorated with white, irregularly spotted with white at hindmargin; some large subterminal spots clearer fawn than the rest, a confluent pair between SC^3 and R^3 particularly round and distinct, bounding proximally a fine white subterminal line which is elsewhere subconfluent; terminal line blackish, slightly interrupted at the veins; fringe whitish, in places darkened.

Hind wing with termen not crenulate, the tooth at SC^2 moderate, the concavity behind it very slight; basal cell large, C anastomosing with SC at little more than a point, SC^2 — R^1 coincident, R^2 very slightly behind middle; white, posteriorly slightly more soiled with brownish; faint traces of two or three sinuous lines in distal half; a fine dark terminal line; fringe mostly white.

Fore wing beneath more smoky, whitest at costa and along front of cell; cell-dot and some costal spots present, the postmedian giving birth to a rather broad dusky band (or double line with some dark filling-in) which is angled outward in front of R^2 ; a weak line beyond, then an indistinct subterminal band. Hind wing with brown proximal shading; an angulated band in middle, a narrow subterminal band and a fine weak line between these.

Habitat.—Mount Kunupi, 6,000 feet, November—December, 1920.

Subfamily GEOMETRINAE.

3. *Leucetaera prosticta* sp. nov.

♂ 29 mm.

Head and palpus brown. Antennal shaft brown; ciliation $1\frac{1}{2}$. Thorax concolorous with wings. (Abdomen wanting). Fore and middle legs tinged with brown; hind leg white.

Fore wing with apex moderately acute (as in *albida* Warr., *Nov. Zool.* iii, p. 394); white, with a moderate admixture (less strong than in *albida*) of glistening pale-bluish scales and with rather sparse and faint brown-grey irroration; costal edge cinnamon; lines more avellaneous; antemedian slightly sinuous, not very strong, obsolescent anteriorly, where it curves inward; postmedian 3 mm. from termen, very faintly incurved behind middle, throughout slender and finely denticulate; cell-dot rather large, black, edged with avellaneous; terminal line obsolete posteriorly, very fine in cellule 3, anteriorly expanding into interneural triangles, which increase in size; fringe mottled with pale avellaneous.

Hing wing with cell-dot very minute; postmedian line continued, curved parallel with termen; terminal line wanting; fringe as on fore wing.

Underside unmarked; both wings (the fore wing more broadly and deeply) tinged with yellow ochre costally; fringes nearly as above.

Habitat.—Mount Kunupi, 6,000 feet, xii, 20—i, 21, one ♂.

Intermediate between *albida* Warr. and *lucens* Warr. (*Nov. Zool.* iii, p. 393), though smaller than either.

4. *Myrteta similaria* Swinh. *sublavata* subsp. nov.

♂, 45—46 mm.

Smaller than typical *similaria* Swinh. Face in lower half purer white. Fore wing in general more strongly dusted in anterior half; beneath with the characteristic smoky apical patch (overlooked in Swinhoe's description) obsolete.

Habitat.—Mount Kunupi, 6,000 feet, November—December, 1920, five ♂♂ (with type), December, 1920—January, 1921, one ♂. Also in coll. Tring Mus. from near Octakwa River, Snow Mountains (one ♂, two ♀♀), and Biagi, British New Guinea (one ♂).

Distinguished from *M. cymodegma* Prout (*supra.* p. 26, Buru) by the stronger irrorations, the different postmedian line and especially by the

presence of hind tibial hair-pencil and abdominal spine; from *obliqua* Hmps. (*Ill. Het.* ix, p. 139) by the last-named characters—Hampson's placing, in *Faun. Ind. Moths* iii, p. 153, under "hind tibiae dilated" being incorrect—and by the less sharply angled hind wing.

5. *Aplochloa eucosmeta* Prout ♂.

Aplochloa eucosmeta Prout, *Nov. Zool.* xxiii, 37 (1916) (Mount Goliath) ♀.

♂, 31 mm.

Antenna nearly simple, closely lamellate, proximally mixed with reddish and blackish on upperside. Hind tibia not dilated. Hind wing with termen more bent in middle than in the holotype ♀, which has hitherto remained unique; a large tornal patch on the same wing, coloured livid-brown to deep brownish-vinaceous (Ridgway pl. xxxix, i) may probably prove aberrational only.

Habitat.—Mount Kunupi, 6,000 feet, November—December, 1920, neallotype ♂.

6. *Hypochrosis ruptifascia* sp. nov.

♂, 42—46 mm.

Face blackish. Palpus orange, with blackish tip. Vertex pale olive-green. Thorax and abdomen above deep purple-grey; on sides, beneath and at anal extremity bright orange. Femora and hind tibia orange, the rest of the legs grey.

Fore wing elongate, apex rather acute, termen strongly oblique, little curved; purple-grey (almost purple) overclouded (variably in the proximal area, solidly towards and as far as the outer line) with olive-brown, the distal area remaining clearer (or with comparatively shadowy maculation), the costal also prevalently purplish; extreme costal edge orange, except apically; black-grey costal spots of rather variable strength, placed about as in *recensata* Prout (1925), the proximal generally large, the distal commonly small; postmedian line as in *recensata*, generally indistinct except through the colour demarcation; the bright green median band very characteristic, being divided into a narrower anterior and a broader posterior element; the former occupying the end of cell and with a narrow projection behind, which typically terminates at M^2 but is sometimes continued so as to form an isthmus between the patches; the latter almost flat at its anterior edge (about submedian fold), indented at its proximal and sometimes (extremely

slightly) at its distal, posteriorly enclosing a spot or dot or some scales of the ground-colour.

Hind wing similarly coloured, costal margin more broadly mixed with orange; no costal spots; the green band thin, fairly uniform in width, a little sinuous (excurved about the base of $R^3 - M^1$, then incurved, then rather oblique outward to abdominal margin).

Fore wing beneath closely similar to those of *incensata* Walk. (1862) and *recensata* Prout, the demarcation between the orange costal streak and the red ground-colour rather sharp, the former widening less in the cell than that of the allies. Hind wing much as in *recensata*, both the grey terminal patches ample, the hinder one extending into cellule 3 either as a prong from its proximal corner or more commonly as a detached spot.

♀, 48—50 mm.

Similar to the ♂, the green anterior spot of fore wing smaller, more isolated, the posterior largely filled in with the ground-colour, the band of the hind wing narrowed.

Habitat.—Mount Kunupi, 6,000 feet, November, 1920—January, 1921, 109 ♂♂, two ♀♀. Wandammen Mountains, 3,000 to 4,000 feet, xi, 1914, a rather smaller form, three ♂♂, one ♀ (A., C., and F. Pratt) also in coll. Joicey.

7. *Heterolocha hypochrysea* sp. nov.

♂, 34 mm.

Face green; frontal tuft rather strong, slightly mixed with reddish. Palpus nearly 2; of a somewhat duller and more nondescript shade. Vertex green. Antennal pectinations 3 or 4. Thorax above green; abdomen paler and greyer, becoming again green from tergite 7; laterally bright yellow, ventrally pale. Fore leg mixed with dark grey. Mid leg pale, the femur hairy. (Hind legs lost.)

Fore wing with costa little shouldered at base, apex rather blunt; $SC^{1,2}$ stalked, their stalk arising from that of $SC^{3,5}$ and anastomosing with C, SC^2 afterwards anastomosing with $SC^{3,4}$, R^2 not greatly before middle of DC, M^1 arising near end of cell; light yellowish-olive, with small scattered blackish strigulae; proximal half of costal edge deep hellebore-red, most broadly at base; a minute black cell-dot.

Hind wing ample, with termen much more convex than in typical *Heterolocha* and very slightly bent at R^2 (less than in *hypoleuca* Hmps., *Journ. Bomb. Nat. Hist. Soc.* xviii, p. 30, which, on account

of the point of origin of SC^1 , the slender build &c., I have transferred to *Heterolocha*); M^1 approximated; as fore wing except costa.

Underside primuline-yellow; fore wing becoming paler yellow behind M and M^2 , costal edge pale pinkish-buff with some dark irroration or strigulation, black cell-dot present; hind wing unicolorous; fringes paler and less bright.

Habitat.—Mount Kunupi, Menoo Valley, 6,000 feet, November—December, 1920.

Probably nearest to *hypoleuca* Hmps., which has similar venation (R^2 more extreme, M^1 of both wings more remote) and similar colouring above; very distinct in the shorter pectinations, less shouldered costa, yellow underside, &c.

8. *Nadagarodes regula* sp. nov.

♀, 4.1 mm.

Face and palpus ochraceous-orange, mixed above with red-brown. Vertex and body concolorous with wings, the abdomen above becoming more ochraceous-buff posteriorly.

Fore wing moderately broad, the apex scarcely so produced as in the genotype ♀, the termen very slightly more oblique; fawn-colour (or vinaceous-fawn, mixed with purplish-grey and with some fine blackish irroration); lines firm, rather thick, almost straight, tawny or slightly ferruginous, overlaid with black; antemedian from costa at 6 mm. to hindmargin at 2 mm.; median from costa at 10 mm. to hindmargin at 5.5; postmedian from costa at 15 or 16 mm. to hindmargin at 11 or 12; subterminal weakly lunulate, indicated chiefly by a faint proximal shade; terminal line very fine and weak, blackish; fringe tawny, slightly irrorated with black.

Hind wing with termen rounded and scarcely waved (much as in the genotype); concolorous with fore wing, at costal margin more buff; the markings continued, excepting the 1st line; median rather nearer to postmedian posteriorly than anteriorly.

Underside bright ochraceous, the fore wing (except behind M and M^2) irrorated with minute black-grey strigulae; median and postmedian lines present, reddish, overlaid (especially the postmedian) with black; median of hind wing touching DC , here very slightly inbent; fringes mixed and tipped with dark grey.

Habitat.—Nomnagihé, 25 miles south of Wangaar, 2,000 feet, January—February, 1921, two ♀ ♀.

There is also a ♀ from Fak-Fak, Dutch New Guinea in coll. Brit. Mus.

9. *Ascotis margarita* Warr. *molynta* subsp. nov.

♂, 58—65 mm.

On an average larger than *m. margarita* Warr. (*Nov. Zool.* i, p. 435, Java), the shades which accompany the lines heavier, browner.

Fore wing with median line less outbent in submedian area, postmedian line thicker and rather more crenulate. Hind wing beneath with the cell-mark sharply expressed (in *m. margarita* generally obsolete, at best very small).

Habitat.—Mount Kunupi, 6,000 feet, December, 1920—January, 1921, two ♂♂. Also known to me from the Arfaks, the Wandammens and the Owen Stanley Range.

10. *Medasina telepompa* sp. nov.

♂, 80—87 mm.

Distinguished from *strixaria* Guen. (*Spéc. Gén. Léop.* ix, p. 217, India), with which it has hitherto remained united, in its deeper and warmer colouring (more as in *similis* Moore, *Lep. Coll. Ath.* p. 235, &c.), the slightly more crenulate termen (especially of the hind wing) and by the formation of the postmedian line of both wings. Abdomen strongly hairy laterally as well as ventrally.

Fore wing varied, cinnamon-buff to tawny-olive, a little whitened at a part of M and base of M², the dark strigulation strong costally, the deep brown shade behind postmedian very strong, at least as far as the subterminal; postmedian more evenly waved than in *strixaria*; cell-spot large but rarely sharp.

Hind wing with the postmedian line much less outbent at R¹ than in *strixaria*, less incurved between M² and abdominal margin.

Habitat.—Nomnagihé, 2,000 feet, January—February, 1921, ten ♂♂ (type and paratypes); Mount Kunupi, 6,000 feet, November—December, 1920, one ♂. Also known from Fak-Fak, the Arfak Mountains, Owen Stanley Range and Hydrographer Mountains.

A similar but rather paler race—more approaching *strixaria* in colouring—occurs at Mackay, Queensland (two ♂♂, two ♀♀, in coll. Tring Mus.).

11. *Catoria camelaria* (Guen.) *baryconia* subsp. nov.

♂, 47 mm.

Larger than *c. camelaria* Guen. (1858), the wings above more heavily irrorated, beneath suffused throughout.

Habitat.—Nomnagihé, January—February, 1921, type; Mount Kunupi, November—December, 1920, paratype.

The same race occurs also near the Utakwa River (Dutch New Guinea), Sattelberg (N. E. New Guinea), and on the Mambare and Aroa Rivers (British New Guinea).

12. *Catoria sublavaria* (Guen.) *psimythota* subsp. nov.

♂, 48 mm; ♀, 52 mm.

Upperside nearly like the most bluish-white forms of *s. sublavaria* Guen. (1858), or somewhat whiter; the black cell-dot of the hind wing rather strong. Fore wing beneath with the border blacker, broader, at least apically; hind wing beneath white, with the subterminal band only developed anteriorly, here rather sharp.

Habitat.—Nomnagihé, January—February, 1921, type ♂; Mount Kunupi, November—December, 1920, allotype ♀.

Also known to me from Kapaur, Base Camp (Utakwa River, Rothsch., *Lep. Br. Orn. Un. Exp.*, p. 86, as *sublavaria*) Humboldt Bay (Dutch New Guinea) and Kumusi River (British New Guinea).

SOME NEW FORMS OF THE NOCTUID GENUS *ERICEIA*.

WITH NOTES ON THREE PREVIOUSLY-DESCRIBED SPECIES.

BY MISS A. E. PROUT.

1. *Ericcia dysmorpha* sp. nov.

σ , 65 mm.

Antenna with long, curved bristles (longer than diameter of shaft) and shorter ciliation (almost half diameter of shaft). Pectus, femora and tibiae densely clothed with long, woolly hair; hind tarsus apparently hairy to end of segment 3 (the hair a good deal worn); fore tarsus with first segment tufted on both sides with thick hair; mid tarsus with slighter hair on segment 1. Fore wing very long, narrow and elongate, with a slight ridge at middle of hindmargin, preceded by a weakly-scaled scar. Hind wing semi-quadrate, with the termen almost straight (though crenulate) from SC' to R' , scarcely curved to M^2 .

Resembles *E. epitheca* Swinh., *Ann. Mag. Nat. Hist.* (8), xvi, p. 180 (1915) (Fergusson Island) (φ), but is less ochraceous in tone, the termen of both wings being tinged with violet-grey; markings indistinct, the best-defined being the blackish orbicular dot and moderate-sized, rather diffused, kidney-shaped reniform on fore wing and the median line on hind wing, which is straighter than in *epitheca*; the other lines and diffused subterminal band of *epitheca* also present.

Fore wing beneath and distal half of hind wing greyish-fuscous; proximal half of hind wing pale ochraceous, crossed by fuscous medial and postmedial lines and with a dark discal dot.

Habitat.—Solomon Island: Choiseul (A. S. Meek), σ holotype only.

2. *Ericcia intextilia* Schultze.

Remigia intextilia Schultze, *J. Sci. Phil.* iii, p. 32 (1908) (Philippines).

The description of this species being somewhat inadequate for purposes of identification, a further description is appended, taken

mainly from a ♂ in the Joicey Collection, from Mindanao, with some reference to a single Philippine ♂ in the Brit. Mus. coll. From the figure and locality these appear to be the true *intextilia* of Schultze.

♂, 51 mm.

Antenna nearly as in No. 1. Hind tarsus shows hair only on segments 1 and 2, but as the hind leg is wanting in one ♂ and damaged in the other, this observation may well be inaccurate. Fore tarsus with vestigial tuft at proximal end. Mid tarsus with segment 1 thickly hairy. Fore wing of medium breadth, not conspicuously elongate, with a slight ridge at middle of hindmargin, which bends forward on to the wing towards the postmedial line and is preceded by a small, weakly-scaled scar; fringe very short at middle of the ridge. Hind wing bent at R².

Both wings above a deep tawny-olive, greyer towards termen, almost covered by fuscous irroration, the veins darkened with snuff-brown; a rather narrow, proximally-diffused dark chocolate subterminal band, distally pale-edged and with another slight dark line beyond the pale border; other markings very obscure, the slightly-curved medial line on hind wing being perhaps the least indistinct.

Wings beneath dark brownish drab, except at the base and hindmargin of hind wing, which are almost buff-yellow; both wings with discal spot and faint traces of medial and postmedial lines and of the subterminal band.

A single ♂ in the Joicey Collection from Soekaboemi, Java, appears very close to the typical form.

Hairy vestiture rather strong, densest in the cell of fore wing beneath.

3. *Ericeia certilinea* sp. nov.

♂, 54 mm.

Antenna nearly as in *E. dysmorpha*, but with the bristles perhaps a little shorter. Hairy vestiture strong. Hind tarsus with segment 1 hairy and with weak hair (hardly reaching distal end) on segment 2; fore tarsus glabrous; mid tarsus hairy on proximal part of segment 1. Fore wing nearly as in *intextilia* but appearing slightly more elongate. Hind wing slightly more quadrate than in *intextilia*.

Wing pinkish-buff, sparsely irrorated with chestnut, conspicuously paler beyond the subterminal lines. Orbicular and reniform well-defined, pale chestnut, dark-outlined; medial, two postmedial and three subter-

minal lines pale chestnut, fairly well-defined, the subterminals not forming a distinct band (as in the foregoing forms). Fore wing and distal half of hind wing beneath pale wood-brown tinged with fuscous; proximal half of hind wing paler warm buff, irrorated at costa with wood-brown; lines straight, indistinct with the exception of the medial line on hind wing, which stands out strongly in contrast with the pale ground-colour.

Habitat.—Solomon Islands: Choiseul (A. S. Meek), one ♂ holotype. A worn ♂ from the same locality in the Brit. Mus. coll. is placed by Sir G. Hampson under *E. epitheca* Swinh., from which species it is at once distinguishable by the smaller size, narrower fore wing, more angulate hind wing, by the postmedial and subterminal lines, etc.

This may be merely a race of *intextilia*, but seems more probably a closely-related species.

4. *Ericcia eurytaenia* sp. nov.

♀, 46 mm.

Wings above pale tawny-olive. Distinguished from all other *Ericcia* species at present known to me by the presence on both wings of a very broad warm sepia subterminal band extending to the postmedial line, distally very sharply-defined and followed by a moderately fine warm sepia line, oblique from apex, close to the subterminal band from SC^b to hindmargin. The reniform and a slightly diffused medial line on both wings nearly agree in tone with the subterminal band, but are not quite so dark.

Wings beneath a little paler than above, with discal spot, medial line and subterminal shade on both wings, the last-named rather unusually broad on the fore wing.

Habitat.—Ceylon: Haldumulla (ex coll. G. C. Alston) one ♀ holotype.

To this species almost certainly belong some specimens from Nilgiris in the Brit. Mus. coll., placed by Sir G. Hampson as *inangulata* Guen., Ab. 3. From these is drawn the following description of the ♂.

♂, 46—50 mm.

Antennal ciliation rather short, hardly as long as diameter of shaft even at its longest. Hind tarsus with very long hair, tapering to the distal end of segment 4, with very slight hair on segment 5. Fore

tarsus with dense tuft on first segment. Middle leg with long spreading tuft (apparently from tibio-tarsal joint), covering about half the first segment of tarsus.

This species is at once distinguishable from *inangulata* by the dense tuft on the fore tarsus, which is entirely wanting in *inangulata* (although, in the latter species, the tibia is densely tufted). The hind tarsus is also more strongly hairy in *eurytaenia*.

5. *Ericeia pallidula* sp. nov.

♂, 53 mm.

Antenna nearly as in *korintjiensis* A. E. Prout, *Bull. Hill Mus.* ii, p. 256 (1928) (Sumatra), the ciliation a trifle shorter; hind tarsus with the hairy clothing weak on segment 3, scarcely present on 4; fore tarsus with short, compact hair almost to the end of segment 1; mid tarsus with a loose tuft of hair at proximal end, not reaching much beyond the middle of first segment. Fore wing somewhat less elongate than in either of the foregoing species and without the scar on hind-margin; hind wing scarcely angled at R^3 . Ground-colour slightly darker than in *korintjiensis*, a little greyer than in the majority of *Ericeia* species; markings more or less obscure, especially on distal half of hind wing, where the subterminals are almost obsolete (especially in the type); reniform pale chocolate, somewhat oval with one or two anterior and posterior white dots. Differs from all the neighbouring species in the very pale under surface, which is almost unmarked on the hind wing except for a drab lunule on the discocellulars, and on the fore wing has only a drab discal spot and very weak double postmedial and subterminal lines.

♀, 52—59 mm.

Wings above nearly as in the ♀ of *gonioptila*, but the ground-colour a little more tinged with drab, the reniform more distinct and much more oblique, the subterminal on hind wing more evenly dentate, less angled outward behind R^3 . Underside differing from the allied species as in the ♂.

Central Buru: Kako Tagalago, 2,700 feet, May 1922 (C., F., and J. Pratt), three ♂♂ (holotype), one ♀; Gamoe 'Mrapat, 5,000 feet, March—April, 1922 (C., F., and J. Pratt) one ♀.

In the genitalia this species very closely resembles *E. gonioptila*.

6. *Ericeia gonioptila* A. E. Prout.

Bull. Hill Mus. i, p. 233 (1922) (Ceram).

To the description previously given may be added the following particulars. ♂ antenna with ciliation at its longest hardly more than half diameter of shaft: fore tarsus with short, thick hair, barely reaching the end of segment 1; mid tarsus with long, loose hair, hardly extending to the end of the first segment.

7. *Ericeia occidua* sp. nov.

♂, 52 mm.

Differs from *gonioptila* chiefly in the shape of the hind wing, which is scarcely angled at R^3 and rather fuller behind that vein than in *gonioptila*. In *occidua* the black spot in the fold of fore wing is reduced in size and the lesser spots before hindmargin are paler in tone.

Habitat.—W. China: Teng-yueh-Ting, 1914 (H.M.B.), ♂ holotype only.

A single ♀ from Ceylon (55 mm.) shows a similar fullness of outline towards the tornus of hind wing and is a little deeper in tone than *gonioptila*, with the reniform rather better defined, but otherwise scarcely differs. This is placed here provisionally.

E. occidua so closely resembles *gonioptila* that it was at first intended to describe it as merely a race of that species; but as the genitalia differs in the valve bearing a distinct process at the side, which appears to be entirely wanting in *gonioptila*, it has seemed best to regard the two as separate species. The external structure seems practically identical.

8. *Ericeia canipuncta* sp. nov.

♂, 50 mm.

Antenna nearly as in No. 1. Hind tarsus with long hair to end of segment 3, the other segments missing but, judging by the length of hair at end of segment 3, segment 4 at least should almost certainly be hairy; mid tarsus with segment 1 hairy; fore tarsus tufted with hair to about middle of first segment. Fore wing of moderate breadth, without lobe, fold or scar; hind wing rather strongly angled at R^3 for an *Ericeia* species.

Both wings greyish snuff-brown with the markings very ill-defined.

Fore wing with the reniform and the subterminal band slightly tinged with rufous; distinct whitish spot on costa at the origin of ante- and postmedial lines and a slighter one at origin of the subbasal; an antemedial blackish spot at SM^2 and a medial pale spot before hindmargin.

Hind wing with a pale spot near tornus. Underside of both wings nearly uniform greyish-brown, with slight dark subterminal band and faint traces of discal spot, medial and postmedial lines.

♀, 41 mm.

Both wings pinkish-buff, tinged with violet on the terminal area; subterminal band tinged with rufous and defined by black spots, which on fore wing are most conspicuous proximally between SC^4 and R^2 , in fold (where the spot is much enlarged) and before hindmargin, distally from costa to R^2 , before hindmargin and behind R^3 , where the band is sharply angled; similarly marked on hind wing, but with the anterior black spots less strongly developed. Both wings with medial shade and fairly well-defined double postmedial line, the outer line weak; fore wing with subbasal and antemedial lines fairly well-defined. Wings beneath a shade browner than above, with the lines moderately well-defined; the subterminal with some blackish spots.

Habitat.—Solomon Islands: New Georgia (Meek), one ♂ holotype, two ♀ ♀.

9. *Ericeia amplipennis* A. E. Prout.

Bull. Hill Mus. i, p. 234 (1922) (Central Ceram).

To the description and figure of this species given in *Bull. Hill Mus.* i, should be appended the following structural note. Antenna with the ciliation on the proximal half nearly as long as diameter of shaft, fasciculate; shorter on distal half. Hind tarsus hairy on segments 1 and 2 only; fore tarsus glabrous; mid tarsus with some sparse hair on first half of segment 1. Fore wing with the apex acute, almost falcate, the termen little crenulate; hind wing with the termen rounded, hardly crenulate, scarcely angled at R^3 .

10. *Ericeia euryptera* sp. nov.

♂, 51 mm.

Antenna wanting. Hind tarsus damaged, apparently hairy on segments 1 and 2 only. Fore tarsus glabrous; mid tarsus wanting. Fore wing broad; nearest to *amplipennis* and to *sobria* Wlkr., *Spec.*

Lep. Ins. xiii, p. 1089 (1857) (Moreton Bay), apex less acute than in *amplipennis*, termen more strongly crenulate; wing a little broader than in *sobria*. Ground-colour avellaneous, tinged with violaceous, with minute fuscous irroration; markings well-defined for an *Ericcia* species, the lines fuscous, the reniform and subterminal band tinged with warm sepia, the subterminal more waved than in *amplipennis*, much better developed on the hind wing. Underside with well-defined cell-spots and postmedial line, the other lines also faintly traceable.

♀, 53—62 mm.

Nearly resembles the ♂; medial and subterminal lines stronger, the latter more macular, especially in the larger ♀. Underside typically nearly as in the ♂; in the larger ♀ the subterminal lines are stronger, but even this is without the distinct dark subterminal shade of typical *sobria*.

Habitat.—Kei Island, December 1915—March 1916 (W. J. C. Frost), one ♂ holotype, one ♀; Kei Island, undated, one ♀ (large, dark aberration).

Just possibly a large, broad-winged race of *sobria*, but appears rather to be a distinct species.

11. *Ericcia elongata* sp. nov.

♂, 45—48 mm.

Antenna about as in No. 1. Hind tarsus with loose hair reaching to the end of segment 1; fore and mid tarsi glabrous. Fore wing noticeably narrow and elongate, with the termen distinctly oblique; hind wing distinctly angled at lv^3 .

Ground-colour pale avellaneous; lines weak, with the exception of the subterminal band which is composed of three diffused, nearly coalescent walnut lines, with some fuscous shading on them (weak on the distal line and on the middle line on hind wing); on the fore wing the band is strongest at costa, where it is connected with the apex by an oblique fuscous shade, and there are dark spots on it in the fold and (on proximal line only) at the proximal angle opposite the cell; the weakly-defined reniform is filled in with pale walnut-brown.

Wings beneath paler and slightly greyer than above, with moderately distinct cell-spots and double postmedial and subterminal lines, the latter faintly tinged with rufous; both wings also with faint traces of a medial shade.

Habitat.—Dutch New Guinea: Wandammen Mountains, 3,000 to 4,000 feet, November 1924 (A., C., and F. Pratt), three ♂♂ (holotype).

12. *Ericeia elongata fuscipuncta* subsp. nov.

♂, 42 mm.

Structure as in the typical subspecies, but the fore wing slightly narrower still, more rounded off at the tornus, the angulation of hind wing also slightly accentuated. Ground-colour slightly darker and more tinged with violaceous than in the type-form; the subterminals on fore wing almost broken into blackish spots between the costa and R¹, practically united at the fold by a large black spot, otherwise weaker than in *elongata elongata*; much weaker on the hind wing, where they are only well-defined from M² to the tornus.

Underside nearly as in the typical subspecies, but with the cell-spot of fore wing larger, the lines on the hind wing a little more curved.

Habitat.—Java: Soekaboemi (G. Overdijkink), ♂ holotype only.

A single very worn ♂ from Sarawak in the Joicey Collection is placed here provisionally, but may in reality represent yet another race, being smaller, with perhaps an even narrower fore wing, and with the subterminal showing no dark markings at costa of fore wing.

13. *Ericeia elongata nauarchia* subsp. nov.

♂, 43 mm.

Agrees in shape with subspecies *fuscipuncta* rather than with the typical subspecies. Otherwise on the *upper side* subspecies *nauarchia* very closely resembles the type-form, but is slightly more tinged with ochraceous (especially on thorax and proximal part of wings), with the subterminal band much weaker, almost without the fuscous shades.

Wings beneath with the cell-spots conspicuously black and with a moderately well-defined diffused medial line; the area from the proximal postmedial line to termen broadly darkened but without distinct lines.

Habitat.—Admiralty Islands: Manus Island, 1913, one ♂ holotype.

Three ♀♀ from the same locality, notwithstanding the fact that they bear the same date, show so strong a divergence from the ♂ as to render it very doubtful whether they are the ♀♀ of *nauarchia* at all and are therefore not described.

14. *Ericeia rectimargo* sp. nov.

♂, 58—60 mm.

Antenna about as in No. 1. Hind tarsus with a little loose hair on segment 1 (almost completely wanting in some specimens); fore and mid tarsi glabrous. Fore wing broad, with the apex acute, almost falcate, the termen slightly rounded and scarcely crenulate; hind wing rather short, with the termen somewhat flattened from SC⁵ to the fold, slightly crenulate.

Ground-colour brownish-drab, very smooth and glossy, with the markings obscure; the antemedial, medial, postmedial and subterminal lines are all faintly-defined; orbicular a fuscous spot; reniform and diffused subterminal band on the fore wing tinged with russet; in some specimens the lines are less indistinct than in the type, the subterminals on both wings being more or less defined by fuscous in addition to the russet shading. When in good condition this species is at once recognizable by the white tips of fringes, which stand out very clearly, especially on the hind wing where the termen is also somewhat pale. Wings beneath with a dark macular postmedial line; the termen of wings very pale.

♀, 57 mm.

Differs exceedingly little from the ♂ except in the absence of the long fascicles of cilia on proximal half of antenna and of hair on hind tarsus. Chiefly distinguished by a slight bluish-white subapical spot and rather stronger dark spot in fold on fore wing.

Habitat.—Dutch New Guinea: Wandammen Mountains, 3,000-4,000 feet, November, 1914 (A., C., and F. Pratt), three ♂♂ (holotype), one ♀; Arfak Mountains, 4,000 feet, February—March, 1909 (C. B. Pratt), one ♀; Mount Kunupi, Menoo Valley, Weyland Mountains, 6,000 feet, November—December, 1920 (C., F., and J. Pratt) five ♂♂.

NOTES SUR QUELQUES LYCAENIDAE DES PYRÉNÉES ORIENTALES ET D'ANDORRE.¹

PAR H. STEMPFFER (PARIS).

M. TALBOT, Conservateur du Hill Museum, a bien voulu me confier l'étude des Lycaenides qu'il a capturés en août, 1926, dans la région de l'Hospitalet (Ariège), Porté, Porta (Pyrénées Orientales), Encamps, Cortals-Embalira, Las Escaldas (Andorre).

Je donnerai ci-dessous la liste des espèces récoltées indiquant en même temps les particularités que j'ai pu remarquer.

(1) *Heodes virgaureae* L. (1761).—Hospitalet, Porté, Encamps, Cortals-Embalira : août. Cette espèce est extrêmement variable dans toutes les localités de son habitat, et il est difficile d'y distinguer des races géographiques bien tranchées. Le Dr. Verity ("Faunula Valderiensis," in *Bull. della Soc. entom. Ital.*, 1910, pp. 238-243) a déjà noté que, dans la seule vallée du Gesso, il avait pu constater la présence de douze formes différentes décrites antérieurement comme races locales (?) et de treize formes abératives !

Le Dr. Courvoisier (*Iris*, xxxii, septembre 1, 1918) a montré l'inanité de plusieurs sous-espèces nommés par Frühstorfer. D'après Courvoisier, la race *chrysorhoas* Frhst. (1917), décrite comme spécifiquement allemande et austro-hongroise, s'étend en réalité bien au-delà des frontières de ces pays, notamment en Belgique, dans les plaines de la Suisse, les montagnes de l'Italie centrale, les Alpes Maritimes, les Pyrénées, le Pont, l'Oural, etc. Les exemplaires de l'Hospitalet, de Porté, et d'Andorre semblent référables à cette race. Leur taille moyenne est de 33 mm., un mâle nain n'atteint que 23 mm. Les points noirs marginaux des inférieures du mâle, toujours confluent à la bordure, n'atteignent pas le développement de ceux de la race espagnole *Miegii* Vogel (1857). Deux exemplaires ont le trait discoïdal des supérieures apparent : *f. lunulata* Courv. (1903).

Le dessous offre les taches blanches habituelles, les points noirs sont plutôt réduits.

Les femelles ne se rapprochent pas de la forme *montana* Mey.-Dür

¹ See *Bull. Hill Mus.*, 11, pp. 95-100, for the list of other groups.

(1853) des altitudes alpines correspondantes. Chez elles le dessus des inférieures est au contraire souvent clair doré : f. *galsuintha* Frhst. (1908). Dans quelques exemplaires, les taches noires des inférieures ont une tendance à l'allongement : f. *elongata* Courv. (1903).

(2) **Heodes hippothoe** L. (1761).—Hospitalet, Encamps, Cortals-Embalira.—Race *mirus* Vrtv. (1913). C'est la forme la plus éclatante de l'espèce. Dessus du mâle à reflet violet vif, avec le trait discoïdal des supérieures bien marqué ; parfois la moitié anale des inférieures est entièrement envahie par le noir. Dessus des supérieures des femelles d'un fauve plus clair même que celui des exemplaires alsaciens. Les ocelles du dessous généralement au complet, alors que, dans la forme *euridice* Esp. (1787) (= *eurybia* Ochs. 1807), les ab. *paucipuncta* Courv. (1903) sont fréquentes ; parfois, les points noirs qui bordent du côté interne la liture marginale orange du dessus des inférieures de la femelle sont surmontés de petites lunules d'un blanc bleuâtre. Cette jolie aberration a reçu le nom d'*albido-lunulata* Reverdin (1906) (= *caeruleo-punctata* Trti. et Vrtv. (1901) = *cyanographa* Cabeau (1920)).

(3) **Heodes alciphron** Rott. (1775) subsp. *Gordius* Sulz. (1776).—Hospitalet, Porté. Dessus du mâle fauve doré à reflet violet faible. Dessous des inférieures de la femelle gris cendré clair. Cette forme pyrénéenne semble tendre vers la race *granadensis* Ribbe (1905), d'Andalousie.

(4) **Heodes phlaeas** L. (1761).—Hospitalet, Porté, Porta.

(5) **Heodes dorilis** Hfn. (1766).—Porté, Chemin de Soldeu à Andorra, Chemin des Escaldes à Encamps. Les mâles possèdent en dessus une rangée complète de taches marginales fauves : f. *fulvomarginalis* Schultz (1905). Dessus des supérieures de la femelle d'un fauve clair, non semé d'écailles noires, contrastant avec les inférieures entièrement d'un brun noir à l'exception de la bande marginale : f. *fulvior* Stefanelli (1900).

Toutefois, cette forme femelle ne semble pas raciale, car, décrite de Toscane, je la possède de provenances très diverses : Ozoir-la-Ferrière (Seine et Oise), Nonnenbrück (Ht. Rhin), Coursegoules (Alpes Maritimes).

(6) **Lampides boeticus** L. (1767).—Porté, Chemin des Escaldes à Encamps.

(7) **Plebeius idas** L. (1761).—Hospitalet, Porté. Les races pyrénéennes de cette espèce ont été beaucoup moins étudiées que les races des Alpes. M. Verity (*Ann. S.E.F.*, 1927, p. 11) émet l'hypothèse suivante au sujet de la forme de Vernet-les-Bains, forme qu'il nomme : *saturior* : " Il me semble qu'il pourrait même s'agir de la race alpestre de l'exerge *armoricana* Obth. (1910) que je possède d'une localité aussi rapprochée des Pyrénées que la Gironde."

L'examen des spécimens de l'Hospitalet et de Porté paraît confirmer cette hypothèse. Ceux de Porté (versant Sud de la chaîne) sont, dans l'ensemble, plus robustes et plus vivement colorés, leur taille varie de 26 à 31 mm., alors qu'elle n'est que de 24-27 mm. pour ceux du versant Nord (l'Hospitalet). Mais dans les deux localités les exemplaires ne ressemblent nullement à ceux que l'on trouve communément dans les Alpes françaises entre 1,500 et 2,000 m. La race est plus grande, la bordure marginale noire du mâle plus large; les mâles sont uniformément bruns, sans trace d'écaillés bleues, même à la base, et avec une rangée complète de lunules fauves aux quatre ailes. De plus, le dessous, au lieu d'être d'un gris froid et terne, est lavé de brun. Les ocelles sont au complet. Quelques femelles de Porté, à dessous presque chocolat, avec des dessins hardis, rappellent un peu les femelles d'armoricana de Bretagne.

(8) *Plebeius argus* L. (1758).—Hospitalet, Porta. Deux femelles de l'Hospitalet sont du type alpin ordinaire, mais une femelle, capturée à Porté, appartient à la forme *caerulescens* Peters, la teinte bleue du dessus atteignant les lunules marginales fauves.

(9) *Plebeius medon* Hfn. (1766).—Hospitalet, Porté, Encamps, Cortals-Embalira, Soldeu à Andorra.

La série nombreuse de spécimens capturés dans ces localités ne contient aucun représentant de la forme sombre *allous* Hbn. (1819) qui se trouve dans les Alpes à altitude similaire, au moins en exemplaires de transition. La moyenne semble référent à la race *semimontensis* Vrty. (1928), décrite de Catalogue: lunules marginales fauves du dessus présentes aux quatre ailes, mais atteignant rarement l'apex des supérieures, dessous gris plus ou moins lavé de brun.

(10) *Polyommatus icarus* Rott. (1775).—Hospitalet, Porté, Porta, Chemin de Soldeu à Andorra, Las Escaldas.

(11) *Polyommatus hylas* Esp. (1777) race *macromargarita* Vrty. (1926).—Porté, Porta, Encamps, Cortals-Embalira.

(12) *Polyommatus bellargus* Rott. (1775).—Porté, Encamps, Cortals-Embalira, Las Escaldas.

(13) *Polyommatus coridon* Poda (1761).—Porté, Porta, Encamps, Cortals-Embalira, Soldeu à Andorra, Las Escaldas.

Dans l'ensemble de la nombreuse série capturée, les exemplaires de Las Escaldas tranchent de suite par leur taille plus grande: 32 mm. au lieu de 27-28 mm., leur dessus pâle et plus verdâtre, à bordure marginale diffuse.

M. Verity a référé cette forme à sa race *hispanagallica* (1926). Parmi les spécimens de Porté et d'Encamps, j'ai choisi des types de

variation auxquels, pour la commodité de l'étude qui va suivre, j'ai attribué des numéros d'ordre :—

No. 1—Porté : ocelles submarginaux présents aux quatre ailes en dessus.

No. 2—Porté : même caractères et, de plus, trace de trait fermant la cellule discoidale.

No. 3—Encamps : large bordure d'un noir profond ; pas de trace d'ocelles submarginaux en dessus.

Chez ces trois formes les ocelles du dessous sont nets, mais petits. Soumis à M. Verity, ils ont été déterminés par lui comme appartenant à sa race *minutepunctata* (1926). A première vue j'avais été tenté d'attribuer à *hispana* H.-S. le spécimen No. 2. Connaissant les travaux de M. Ball sur les androconies de *coridon* et de *hispana*, j'ai voulu examiner celles des exemplaires précités, en même temps que celles d'individus de différentes provenances. Je rappelle brièvement les caractères signalés par M. Ball :—

coridon : androconies en forme d'ovale allongé, pointu à son extrémité distale, 5, 6, rarement 7 stries.

hispana : androconies plus larges, à bords latéraux presque parallèles, extrémité distale arrondie, 6, 7, et souvent 8 stries.

Après avoir montés à sec les androconies, je les ai dessinées à la chambre claire afin de pouvoir comparer plus exactement les préparations. M. Ball, auquel je les ai communiqués, a bien voulu contrôler mes croquis, ce qui permet d'affirmer l'exactitude générale, mais je dois dire que le résultat de ces observations est imprévu. Le voici sous forme de tableau :—

Exemplaires de M. Talbot	D'après les caractères macroscopiques	D'après les androconies
No. 1. Porté	<i>coridon-minutepunctata</i> Vrtv. ...	<i>coridon</i>
No. 2. Do.	Do. ...	<i>hispana</i>
No. 3. Encamps	Do. ...	<i>hispana</i>
Exemplaires de provenances diverses		
No. 1. Sierra de Espuna (Murcie)	<i>hispana arragonensis</i> Gerh. ...	<i>coridon</i>
No. 2. Do.	Do. ...	<i>hispana</i>
No. 3. Annot (Basses Alpes) ...	<i>coridon-dinia</i> Vrtv. ...	<i>coridon</i>
No. 4. Do.	Do. ...	<i>hispana</i>
No. 5. Venanson (Alpes Marit.) ...	<i>coridon-dinia</i> Vrtv. ...	<i>coridon</i>
No. 6. Aigoual (Gard)	<i>coridon-gallia</i> Vrtv. ...	<i>coridon</i>
No. 7. St. Paul (Alpes Marit.) ...	<i>hispana reznickei</i> Bart. ...	<i>hispana</i>

Ainsi qu'on le voit, il n'y a pas concordance absolue entre les caractères externes et celui fourni par les écailles androconiales. Cependant, ce dernier est d'ordinaire stable et fourni des indications dans des espèces

aussi rapprochées l'une de l'autre que *idas* L., *ligurica* Obth. et *bellieri* Obth. (voir fig. de Courvoisier dans l'*Et. lep. comp. d'Obth.*, vol. xiv).

On est ainsi amené à former des hypothèses sur les rapports exacts des deux espèces : *coridon* et *hispana*.

D'une part, *hispana* fournit des races qu'il est aisé de séparer à première vue de *coridon*, par exemple *florentina* Vrty.

D'autre part, je possède des exemplaires prise à la Boisse (Ain) en mai, donc *hispana* indiscutables, qu'il serait difficile de différencier à coup sûr sans le secours de l'étiquette.

Je n'entends pas mettre en doute la validité spécifique de l'espèce isolée par M. Verity; il est indéniable qu'à Florence, par exemple, volent des individus appartenant à deux espèces dont la biologie et les caractères externes sont tout différents. Il en est de même près d'Albarracin d'après Chapman. Mais il est certain également qu'aucun caractère microscopique *stable* de différenciation n'a pu être constaté, ni dans les génitalia, ni dans les androconies.

Les deux espèces, *bellargus* Rott. et *coridon* Poda, sont fort proches l'une de l'autre. Leur chenilles ont souvent même nourriture : *Hippocrepis comosa*; leurs aires de dispersion sont presque semblables. Ne peut-on leur prêter une souche commune? Ne peut-on supposer qu'il s'agit là d'espèces mal fixées, en période active d'évolution, qui ont pu donner lieu à des hybrides naturels dans la période ancestrale et le peuvent encore à titre accidentel?

On expliquerait ainsi la formation de l'énigmatique *polonus* Zell. (1845), celle de l'espèce *hispana* dont les androconies ressemblent tant à celles de la seconde génération de *bellargus*.

Je n'ignore pas les objections que l'on peut faire à cette théorie : comment admettre que, sur le même terrain, volent tour à tour le stade *coridon*, le stade *hispana* et le stade *bellargus*, alors que tous ces groupes sont soumis aux mêmes conditions de milieu? Mais si l'on accepte les trois espèces comme bien distinctes, il reste alors le fait inexpliqué de la non concordance fréquente des caractères externes et de la forme des androconies.

(14) *Lycaenopsis argiolus* L. (1758).—Las Escaldas, à Encamps.

NEW FORMS WITH TWO NEW GENERA OF AFRICAN HETEROCERA.

By G. TALBOT.

Unless stated to the contrary, all types are in the Hill Museum.

SYNTOMIDAE.

Metarctia rubripuncta Hmps. f. *rubricosta* f. nov.

M. rubripuncta Hmps., ab. i, *Cat. Lep.* i, p. 148 (1898).

This reddish form with pink hind wing may, perhaps, be only a colour variation.

♀. Upperside of fore wing strongly reddish-brown, the costal edge red; end of cell broadly red, this colour prolonged through the cell. Hind wing salmon pink.

Underside of fore wing as above, but the cell entirely red. Hind wing with the costal edge blackish-brown, and the costal area fuscous.

Habitat.—South Central Angola: Upper Cubango-Cunene Watershed, 5,500 feet, October, 1928, one ♀, taken by T. A. Barns. Also known from the Congo.

ARCTIIDAE.

Subfamily ARCTIINAE.

Spilosoma rubricosta sp. nov. (pl. iv, fig. 6).

Close to *S. euryphlebia* Hamps. (1903), but distinguished by the crimson base of costa of the fore wing.

♂. Fore wing with creamy-white ground-colour, the veins striped with blackish-brown. The stripes are heavy, become narrow distally, and reach the margin. The upper and lower margins of the cell as well as the submedian are outlined by the ground colour, costa crimson at its base for about a fourth. Hind wing ochraceous-yellow. Veins 6—8, slightly blackened at their distal ends.

Antennae black. Head orange-yellow, black on the epicranium, and a black line down the centre of the frons. Patagia and tegulae creamy-

white edged with black on the inner or dorsal side. Femora crimson, creamy-white below; tibiae and tarsi black. Pectus clothed with creamy-white hairs. Abdomen ochraceous-yellow with a dorsal row and two subventral rows of black spots.

♀. Similar to the ♂. The tibiae are yellowish-white on the inner side. Neuration of the fore wing with vein 10 from the cell.

Length of fore wing: ♂ 22 mm., ♀ 26 mm.

Habitat.—Nyasaland: Limbe, January and February, 1928, two ♂♂; Mlange, February, 1923, one ♀. All taken by H. Barlow.

The position of vein 10 in the ♀ of this species is not typical of *Spilosoma*.

Monarctia gen. nov.

Allied apparently to *Dionychopus* H.—S. It differs from this and from all other similar genera in the absence of vein 5 from the hind wing.

Wings shaped as in *Dionychopus*. Fore wing elongate and narrow; hind wing ample, but costa long.

Neuration.—Fore wing with vein 2 from beyond middle of cell, 3 from the angle, 4 and 5 shortly stalked from above the angle, 6 from 9 shortly above the angle of cell, 7, 8, 9 stalked, 10 and 11 from the cell. Hind wing with vein 2 from beyond the middle, 3 and 4 from a point at the angle, 5 absent, 6 and 7 from a point at the upper angle, 8 from before the middle of cell.

Antennae bipectenate. Palpi porrect, rather short and scarcely projecting beyond the frons.

Proboscis moderately developed.

Legs.—Hind tibiae with two pairs of spurs. Fore tibia with a thick blunt and almost straight claw on the inner side.

Type.—*lactea* sp. nov. ♂.

Monarctia lactea sp. nov. (pl. iii, fig. 9).

♂. Wings chalky-white with all the veins black. The hind wing cross-veins more strongly outlined than those on the fore wing, but the submedian veins not much blackened. Underside of fore wing with a distal middle cell-streak bluish-black.

Antennae black. Head, thorax, and abdomen white. Abdomen with six black dorsal bands, and subventral black spots. Femora and tibiae white on the outside, black on the inner side; tarsi black.

Length of fore wing, 29 mm., width from apex to end of submedian, 13.5 mm.

Length of hind wing from base to end of vein 7, 20 mm.

Habitat.—South Central Angola: Upper Cubango-Cunene Watershed, 5,500 feet, October, 1928, one ♂, collected by T. A. Barns.

This species bears a very close resemblance to *Spilosoma pura* Leech, from China and Yunnan.

Subfamily CALLIMORPHINAE.

Carpostalagma chalybeata sp. nov. (pl. iv, fig. 12).

In this species veins 8 and 9 of the fore wing are on a shorter stalk than in *viridis* Plötz, or in the other described hereafter.

♂. Coloration of both sides a deep bluish-grey, somewhat as the marginal area of the hind wing in *viridis*. Fore wing above with a silvery-white oblong patch below the cell near the base. A small yellow discocellular spot, and two yellow dots on the inner margin, one proximally and one distally of the white patch. Hind wing with basal area whitish.

Underside with paler ground-colour and still paler distal marginal areas. Hind wing with basal grey-white area from the inner margin to middle of cell and to slightly outside the cell.

Antennae black, basal segment and tuft yellow. Palpi blackish-brown marked with fuscous-brown laterally. Head bluish-grey, frons fuscous-brown. Thorax bluish-grey, a yellow tuft at its base. Legs pale fuscous-brown, tarsi darker. Abdomen grey-brown, bluish dorsally at the base; anal tuft yellow, slightly bluish-grey below at its base.

Length of fore wing, 19 mm.

Habitat.—Belgian Congo: Ruanda District, Kabira Forest, 12 miles north of Usambara, 7,000 feet, January, 1924, wet season one ♂ collected by T. A. Barns.

Carpostalagma pulverulentus sp. nov.

Distinguished from *chalybeata* by the greenish-yellow fore wings.

♂. Fore wing above greenish-yellow, with white scales sparsely scattered over the whole wing. Below the cell a small rounded white spot not so large as in *viridis*. A narrow and irregular distal border of paler yellow, and a similarly coloured indistinct postdiscal band from the costa to the margin above the tornus. Hind wing bluish-grey, paler at the base.

Underside bluish-grey. Fore wing paler below the cell, the spot above showing through. Hind wing with an indistinct darker post-discal band from the costa to the inner margin, and a small discocellular mark.

Antennae missing. Head and palpi pale brown; thorax pale brown. Legs fuscous-brown. Abdomen fuscous-brown, anal tuft paler. A small yellow spot at the base of the thorax.

Length of fore wing, 18 mm.

Habitat.—Uganda: Toro, one ♂.

LYMANTRIIDAE.

Barlowia gen. nov. (text fig. 2).

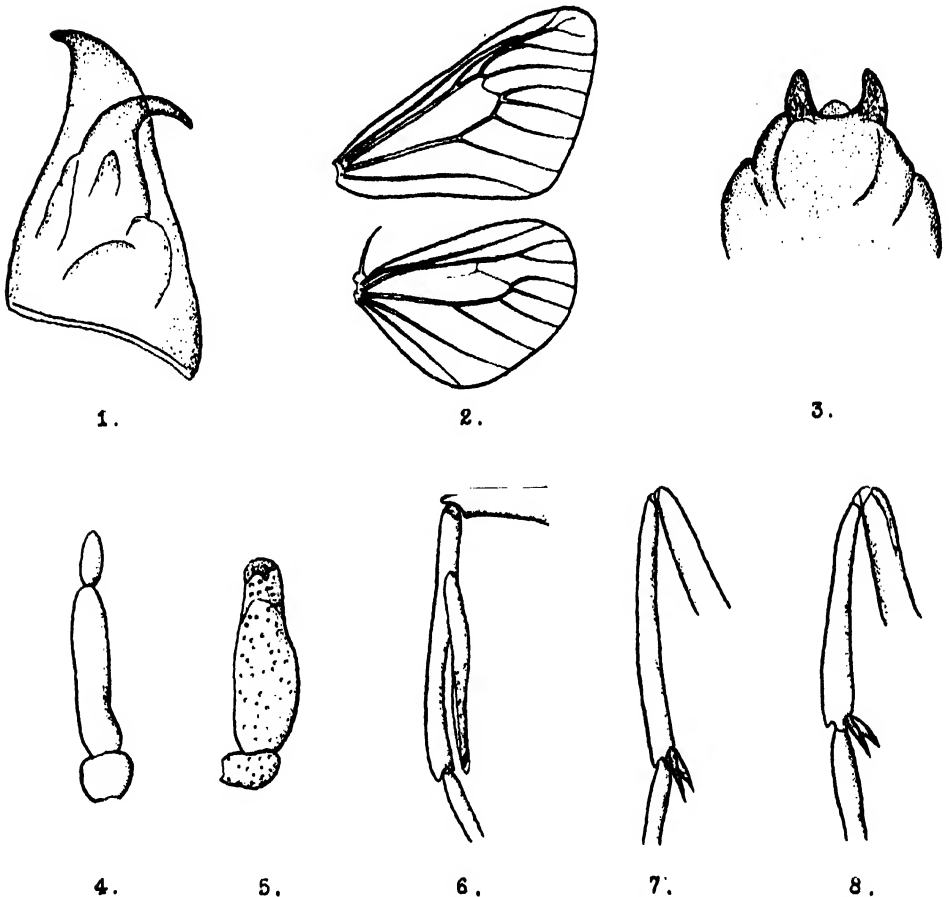


FIG. 2.—Structure of *Barlowia zelotes*. 1, valve; 2, neuration; 3, uncus; 4, ♂ palpus; 5, ♀ palpus; 6, fore leg; 7, mid leg; 8, hind leg. (From drawings by N. Bennett.)

Apparently allied to *Aconophlebia* Butl. (1898) but has different palpi, different hind wing neuration, and slightly different fore wing neuration.

Neuration.—Fore wing: veins 4 and 5 arising close together, 6 from below upper angle of cell, 7, 8, 9, 10 stalked, with 10 arising below 7, and in the ♂ coincident with 11 for the greater part, forming an imperfect areole. In the ♀ vein 10 is free from 11 and no areole is formed. Hind wing: vein 4 nearer to 5 than to 3, 6 and 7 are on a stalk equal to the length of these veins.

Palpi porrect and projecting beyond the frons, heavily clothed with long scales, some hair at the base. ♂ palpus with three segments, the middle one about three times as long as the third. ♀ palpus with two segments, the third fused with the second.

Antennae short and bipectenate, in the ♂ with long ciliated pinnae, in the ♀ with much shorter pinnae and reduced cilia.

Legs: fore leg, with the tibial blade about three-quarter length of the tibia, and arising well below the base of tibia, projecting slightly beyond the anterior end. Distal half of blade narrower than the proximal half and narrowing anteriorly. Mid and hind tibiae with one terminal pair of spurs.

Genitalia: uncus broad, bilobed; narrowed anteriorly to a blunt point, and curved inwards. Valve triangular, the apex sharply narrowed and curved dorsad. A large hook-shaped process arises from the inner middle area of the valve. We cannot say what features of this genital structure are peculiar to the genus.

Genotype: *zelotes* sp. nov.

The genus is dedicated to Mr. H. Barlow, who sent the specimens and who is responsible for collecting much choice and interesting material in Nyasaland over a period of several years.

Barlowia zelotes sp. nov. (pl. iii, fig. 3 ♂, 4 ♀).

This is one of the most remarkable species so far made known in the *Lymantriidae*, as not only does it constitute a new genus but the sexes are extremely dissimilar. The ♀ exhibiting the red and yellow pattern of some *Agaristidae* being the only case known of the appearance of this mimetic pattern group in the *Lymantriids*.

♂. Fore wing on both sides ochraceous-yellow, with broad black distal area and black costal edge. The black area extends to the cell

cross-veins, does not reach the base of vein 3, and is narrower, at the tornus. Hind wing of the same colour as the fore wing, with a black outer marginal border about 2 mm. wide.

Head, thorax and abdomen ochraceous-yellow. Palpi with the third segment black, the remainder ochraceous-yellow. Antennae black. Tarsi and the outsides of tibiae and femora black, the remainder ochraceous-yellow. Abdomen with small black dorsal spots, and a subventral series of black dots, anal tuft with admixture of black hairs.

♀. Much larger than the ♂. Fore wing with black ground-colour and orange-yellow areas. The basal area extends to vein 2, its edge above and below this point being incurved. A broad discal band extends from the costa to before the tornus, not touching the inner margin. The inner edge of this band is straight and crosses the base of cellule 2; the outer edge is less even and extends to the cell cross-veins, not filling the lower angle of cell, and barely invading the base of cellule 3, between vein 2 and the submedian; this edge is at right angles to vein 2; posteriorly the band is limited by the submedian. A broad and short subapical band from vein 11 to just below vein 3, its inner edge projecting below vein 4, its outer edge slightly irregular and somewhat excurved; this band is narrowed slightly anteriorly. Hind wing crimson with a black outer marginal border about 2--5 mm. wide at vein 4, a little wider anteriorly and posteriorly of vein 4.

On the underside the discal band and proximal area of fore wing are tinged with crimson.

Head and antennae black, the frons yellow at the sides. Thorax and legs black. Abdomen ochraceous-yellow, the ventral surface black, slight black anal tuft, and dorsal and subventral small black spots as in the ♂.

Length of fore wing, ♂ 17.5--19 mm., ♀ 25--27 mm.

Habitat.—Nyasaland: Zomba, August, 1925, one ♂ (holotype); Mlange, February, 1925, two ♂♂, one ♀ (allotype); also from Zomba, April 1923, one ♂, all collected by H. Barlow. The following specimens collected by Dr. S. A. Neave: Mount Mlange; 18.iii.1913, one ♀; 24.ii.1913, one ♀; 23.i.1914, one ♀.

Also one ♀ from Kashitu, North-west Rhodesia, 24.v.1915, collected by H. C. Dollman. In this specimen the fore wing measures 28 mm. The discal band is narrower, and the subapical band is narrowed at the posterior end.

All specimens are in the British Museum; those received from Mr. Barlow were presented by Mr. J. J. Joicey.

The ♂ is very similar in appearance to both sexes of the Lymantriid species *Bracharoa charax* Druce. In the same part of Nyasaland is found a very similar looking Zygaenid, *Staphylinochrous whytei* Butl. (pl. iii, fig. 5). The ♀ nearly resembles species of the Agaristid genus *Heraclia* (*Xanthospilopteryx*) of which *H. perdis* Druce occurs in the same district. A closer resemblance is however afforded by *H. jugans* Jord. (pl. iii, fig. 6) from Angola. This species may be found yet in Rhodesia.

LASIOCAMPIDAE.

Streblota thomensis sp. nov. (pl. iv, fig. 14).

Mr. W. H. T. Tams kindly informs me that this species is allied to the group of *basale* Walk.

♂. Upperside vandyke-brown. Fore wing with distal and inner areas paler. A thin black postdiscal line, narrowly edged on its outside with grey-white. This line is placed about midway between the cell and the margin, is slightly incurved at vein 8, bent distad and thinning out to the costa before the apex, posteriorly not reaching much below vein 2. This line is distally bordered broadly by a pale brown shade from its lower end to vein 8; the edge of this shade is incurved between the veins, the tooth on veins 3 and 5 projecting more strongly than the others. Below vein 2 a curved dark brown line runs from the base to near the tornus, cutting off a paler brown inner area. Below the cell, at the base, is a deep brown patch which is narrowly edged posteriorly with snow-white.

Hind wing without markings, much paler over the anterior area.

Underside paler than above, and paler in the proximal areas. Fore wing with the postdiscal line indicated.

Antennae and abdomen pale brown. Head, thorax, palpus, and legs vandyke-brown.

Length of fore wing, 23 mm.

Habitat.—Sao Thomé, 10—24 January, 1926, one ♂ taken by T. A. Barns on the edge of the virgin forest.

ZYGAENIDAE.

Anomocotes instabilis sp. nov.

Allied to *triangularis* Jord. (1907). The author of this species kindly informs me that it has different neuration and genitalia.

♂. Proximal area of wings yellowish-brown, distal area smoky-black. The yellowish-brown colour does not reach vein 3 nor the cell-end in the fore wing; it extends to the costa and inner margin. Hind wing with proximal yellowish-brown area extended beyond the cell more so on the underside than on the upperside. Neuration of fore wing variable. In two specimens veins 7, 8, 9, are stalked, and in the other four specimens veins 7 and 8 are stalked and 9 is absent. The form with 9 absent is taken as the type of this species.

Antennae black, yellowish-brown at the base. Head, thorax, legs, and abdomen yellowish-brown. Abdomen with slight black dorsal hair and black anal tuft.

The uncus is of a similar form in all six specimens, being narrow and triangular with a blunt apex.

Length of fore wing, 11—14 mm.

Habitat.—Cameroons: Bitye, Ja River, April, one ♂ (holotype); early May and June, wet season, one ♂; October, wet season, one ♂; October and November, wet season, one ♂. The following with veins 7, 8, 9, stalked: October, wet season, two ♂♂; all taken by G. L. Bates.

Anomoeotes simulatrix sp. nov.

A larger species than *instabilis*, and closely resembling it in colour. The uncus, however, is of a different form. It is somewhat oblong with the end excavated, forming two short and narrow lobes. Neuration as in most other species with 7, 8, 9 stalked, and with 7 removed more distad than in *instabilis*.

♂. Proximal area of wings yellowish-brown, distal area smoky-black. The yellowish-brown colour extends into cellule 3 and nearly to the cell-end on the underside. The hind wing is yellowish-brown to just beyond the cell.

Head missing. Thorax, legs, and abdomen yellowish-brown. Abdomen mostly black on the dorsum.

Length of fore wing, 15 mm.

Habitat.—Belgian Congo: Upper Kasai District, P. Landbeck, one ♂.

A NEW GENUS OF PERICOPINAE

(Family ARCTIDÆ).

BY G. TALBOT.

Thermidarectia gen. nov.

Allied to *Scearctia* Hering (Seitz' *Macrolep.*, vi, p. 451, 1925). Hind tibiae with two pairs of spurs. Fore wing with veins 7—10 forked, 7 before 10, and vein 6 arising well below the stalk of the other veins. Hind wing with vein 4 nearer to 5 than to 3. Wings ample, fore wing not narrow.

Genotype: *thermidoides* sp. nov. ♀.

Thermidarctia thermidoides sp. nov. (pl. iii, fig. 7).

This species is remarkable for its almost perfect resemblance to a member of the *Diopitidæ*, *Thermidia dimidiata discinota* Warr. (pl. iii, fig. 8) (1900), the two insects occurring in Merida, Venezuela. They are, of course, at once distinguished by the quite different neuration of both wings.

♀. Deep bluish-black with ochraceous-yellow proximal area. Fore wing with the base bluish-black. The proximal yellow area traversed by five lines of ground-colour, extending outwards to vein 2 and slightly excurved below this vein. Hind wing with the proximal area reaching beyond the cell; edge of cell striped with ground-colour from the base to vein 2, and two similar stripes in the submedian area, coalescing for the greater part, the lower one reaching the margin. Distal area narrowing posteriorly.

Underside as above. Fore wing with the proximal stripe below the cell more strongly marked than the others. Hind wing with the submedian stripes less strongly marked than above.

Head, thorax, and abdomen deep bluish-black. Antennae black. Palpi, legs, and ventral surface of abdomen fuscous.

Length of fore wing, 22—23·5 mm.

Width of fore wing from apex to submedian, 12 mm.

Habitat.—Merida, Venezuela, one ♂ (holotype); also one ♀ without locality. In the type, vein 7 in the left fore wing arises very close to the cell angle.

THREE NEW SPECIES OF HESPERIIDAE FROM MATTO GROSSO.

By N. D. RILEY, F.E.S.

All the specimens to which reference is made are in the
British Museum.

Staphylus conjuncta sp. nov.

♂. Upperside dark slate-grey, marked with black. Fore wing: base to about one-third length of cell black, the black extending along costa to

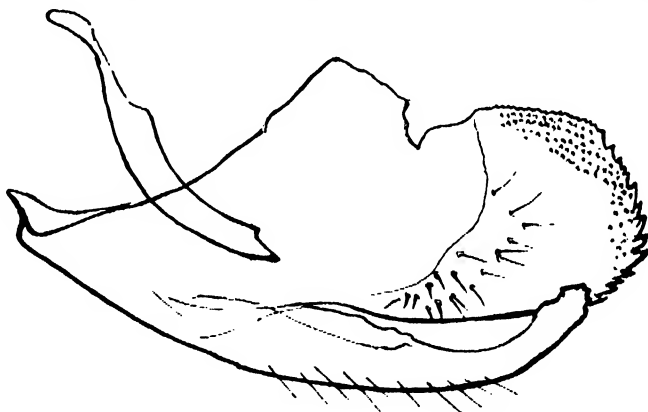


FIG. 3. *Staphylus conjuncta* sp. nov. Left clasper and penis.

cell-apex; connected with costal black area are a small square spot in centre of cell, and a large square spot at cell-end; the lower angles of the latter large spot are joined on either side to two moderately large spots in area 2, the outer by means of a small triangular spot at the base of area 3; contiguous with the two spots in area 2, and in line with them, are two in area 1a, of which the inner is the larger and is joined by means of a black point at the base of area 2 to the central cell-spot; the outer square spots in 1a and 2 form part of the discal series which is continued by a small rectangular spot in area 3 (displaced outwardly but just connecting with the one in area 2), which in turn just touches at its outer angle a solid band of spots, arranged in an even curve and

extending to the costa, so placed that between them and the cell-end is a clear space of the ground-colour at least as wide as the black spot at the cell-end; a rather shadowy submarginal series of sagittate or crescentic spots of which those in areas 2 and 3 are the largest; a fine black anteciliar line; cilia long, grey-brown.

Hind wing basal third black, enclosing a small square spot of ground-colour in the cell, and a fainter one below it in 1b; a bar of ground-colour at cell-end; remainder of wing also black except for a discal and a submarginal series of small squarish isolated spots of the ground colour somewhat irregularly arranged; anteciliar line and cilia as on fore wing.

Underside: fore wing dark brown, faintly shining, inner margin markedly paler; a square slate-grey spot at cell-end followed by a postdiscal series of spots (only divided by the veins, and strongly curved anteriorly) from costa to vein 2. Hind wing marked as on the upperside.

All body parts, legs, antennae, palpi, etc., dark-brown.

Fore wing measurements: costa 13 mm.; termen 9.5 mm.; inner margin 9 mm.

Type: One ♂ from Campo Grande, 150 miles south-east of Corumbá, Matto Grosso, Brazil, 1,750 feet, 10-11.vi.27 (C. L. Collenette). Also in B.M., one ♂ with same data as Type, four ♂♂, Chapada, Matto Grosso (H. H. Smith); one ♂, Haparica, Brazil, 13.xii.05 (Meade-Waldo).

This species comes nearest in superficial appearance to *S. alicus* Schaus, differing from it in the manner in which the dark transverse bands on the upperside of the fore wing link up with one another; in *alicus* they run parallel and are well separated. It is conceivable that it has already been described, but I have been quite unable to relate it to any published description. The accompanying sketch of the male clasp and penis, drawn from an old preparation made many years ago by Godman and Salvin from one of the males obtained by H. H. Smith, will probably serve to define the species more readily than the description. Unfortunately the tegumen and uncus in the preparation are so broken that their structure is no longer ascertainable.

Prenes virilis, sp. nov.

♂. Upperside dark brown with a slight purplish tint; basal third of hind wing and inner margin of fore wing clothed obscurely with longish green hair-scales; circular patch of glandular scales (androconia)

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around base of vein 2 in areas 1a and 2; a few green scales along costal area of fore wing.

Fore wing with seven small translucent white spots: a pair in cell, distally, the upper one the more distant from base; a small oblong one from base of vein 3 to vein 2, twice as tall as broad; a fourth, quite small, towards base of area 3; and three apical-costal spots, the uppermost about 1 mm. long, the lowest punctiform; a small area centrally in 1a, below stigma, faintly paler than ground-colour. Stigma not very prominent, circular, divided equally by vein 2, the upper semicircle lying in the base of area 2. Hind wing with a faint suggestion of a wide, curved discal paler band.

Underside: fore wing ground-colour dark brown, the apical third grey with a faint purplish tint; the translucent spots as on the upperside, but the apical three enclosed in a light grey irregular patch which radiates outwardly along veins 3—9 almost to the margin; area 11, and a large rectangular patch about 4 mm. long in area 1a, entirely white.

Hind wing ground-colour light grey with a faint lilacine tint; the outer half of the cell bounded by a curved band of olivaceous, intersected by the veins, and extending faintly into the cell, so that the whole resembles a roughly circular olivaceous patch centred on a white dot at cell-end; a submarginal series of oblong olivaceous spots between the veins from just below vein 2 to costa; anal area extensively, and also abdominal area at least distally, violaceous. Head, thorax and abdomen above dark olivaceous brown. Antennæ black, the crook of the club red-brown, under surface of club pale grey. Palpi pure white, the minute apical joint black, the tip of second joint olivaceous. Lower surface of thorax and abdomen white. Legs brown, the femora white. Length of fore wing 15 mm.

Holotype ♂ in British Museum, from Tombador, 16 miles south of Diamantino, Matto Grosso, Brazil, 19.viii.27, 1,500 feet (C. L. Collenette); paratype ♂, Chapada, Matto Grosso (H. H. Smith), also in British Museum.

This species is closely allied to *P. nyctelius*¹ Latr. (= *ares*, Felder = *coscinia*, H.S.). It differs in several important points. It is rather small; the upper of the two cell-spots in the fore wing is further from the base; the apex of the fore wing is more sharply produced; the

¹ Examination of the type specimen of *P. nyctelius*, Latr., has confirmed the opinion expressed (*Trans. Ent. Soc. London*, LXXIV, p. 284, 1926), that the name applies to the species commonly known as *Prenes ares*, Feld., and not to *Prenes sylvicola*, H.S.

hind wings are rather narrower; and the dark transverse band that is so prominent a feature of the underside of the hind wing of *nyctelius* is altered in position so as to surround compactly the distal half of the cell.

Pythonides bibulus sp. nov.

♂. Upperside brownish olive, mottled with black and marked with white translucent spots and cream-coloured patches. Fore wing: a short distance from base a crescent-shaped mark rather paler than ground-colour, lying between inner margin and the upper edge of cell; this mark followed immediately, at one-third from base, by an irregular transverse black band, anteriorly twice as wide as posteriorly, extending from costa to inner margin; from costa, anteriorly contiguous with the black band, a band of translucent, cream-coloured spots from costa to vein 2, of which the spot in cell is dumb-bell-shaped, that in area 2 square; a black costal patch immediately follows the translucent band, and beyond it is a cluster of 4 minute translucent spots, three of which (in areas 6, 7, and 9) are in line, whilst the fourth, which is the largest, though touching them, lies mainly beyond them; a minute translucent spot at base of area 3; an irregular black, inwardly diffuse, submarginal band, commencing at apex; cilia grey, broadly darkened at the extremities of the veins.

Hind wing ground-colour darker than that of fore wing; basal third almost black; median third occupied by a pale cream-coloured band from vein 8 to vein 1b, which commences as a square spot in area 7, and is elsewhere twice as wide; outer third heavily marked with two series of rounded blackish spots, the outer series by far the more conspicuous and anteriorly composed of very large spots; abdominal area grey; cilia as on fore wing.

Underside as above, but less olivaceous and generally rather greyer; markings as above. Fore wing costa yellowish from base to end of cell, the translucent band continued by means of a divided creamy patch, to vein 1; a minute pale spot in area 4, and another in area 5, slightly beyond the line of the subapical cluster. On the hind wing the median band shades imperceptibly into costal and abdominal areas that are paler than on the upper surface.

Head, thorax and abdomen greyish-olivaceous. Antennae black above, pale buff beneath. Palpi cream-coloured, the portions of 2nd segment visible from above olivaceous, the third segment black; thorax and abdomen beneath, and legs, cream-coloured or buff.

Length of fore wing (costa) 12 mm. ; inner margin 9.5 mm. ; outer margin 7.5 mm. ; outer margin evenly convex, slightly excised below vein 2. Hind wing margin gently sinuate, especially above vein 4, not posteriorly elongate, abdominal margin 2 mm. longer than abdomen. Fore wing with vein 5 straight throughout, midway between 4 and 6 ; vein 3 well before cell-end ; 2 nearer to base than to 3 ; hind wing with vein 2 much longer than vein 7, vein 5 imperfect. Fore wing without costal fold or stigma, but with a pocket 1.5 mm. long filled with black scales situated in the costal edge of fore wing at one-third from base. Antennal club sickle-shaped, acuminate. Palpi projecting a distance equal to the width of the head between the eyes ; 2nd segment moderately hirsute and almost concealing the small conical porrect apical segment. Hind tibiae with two pairs of spurs and tuft of long hairs.

Holotype ♂ from Melguira, 10 miles south of Diamantino, 2,000 feet, 23.v—3.vi.1927, Matto Grosso, Brazil (C.L. Collenette).

The unique type was taken drinking at wet sand. Melguira, Mr. Collenette tells me, lies just within the Amazonian basin.

Structural characters have been given above at some length, as it is open to doubt as to whether the species is correctly placed in *Pythonides*. According to Watson's keys to the genera of HesperIIDae,¹ it runs out to *Erites* Mabille, an African genus with which it manifestly has only a distant affinity—the palpi are quite different for example. In certain details of wing marking *P. bibulus* shows some approach to *Pythonides lugubris* Felder, but its general appearance suggests, more than anything else, the members of the African genus *Eagris*.

¹ *P.Z.S.*, 1893, p. 43.

FOUR NEW BUTTERFLIES FROM AFRICA.

BY G. TALBOT.

PIERIDAE.

Pieris calypso Drury (1773) *sudanensis* subsp. nov.

This form partakes of the lighter underside colouring of the Cameroons *dentigera* Butl. (1888) and of the larger spots and heavier black margins of the Uganda race.

♂. Larger than the Uganda race. Fore wing above with the black margin less marked with white as in some specimens of *dentigera*, and a little wider than in this race. Hind wing with larger marginal spots than in *dentigera*.

Underside of fore wing with the costa blackened and a short black subcostal streak near its middle. Basal orange area larger than in *dentigera* when present in that race. Hind wing white or tinged with cream, spots larger than in *dentigera*.

♀. Resembles some specimens of *welwitschi* Rogenh. (1889). Fore wing white with broad blackish-brown apical and marginal border. Costal bar narrowed to the discocellular spot which is small. Basal area dusted with blackish. Hind wing bright yellow with triangular marginal spots and small submarginal spots as in *welwitschi*.

Underside as in most *welwitschi* specimens, but the basal area of the fore wing is yellow (not red) to the costal bar and the hind wing marginal spots are well developed. The white distal spots of the fore wing are marked with buff-yellow.

Habitat.—South Sudan: Bahr-el-Ghazal, Ahuri, 21.v.1915, two ♂♂ (holotype), also from the same region two ♂♂, one ♀ (allotype). South-east Sudan: Imatong Mountains, three ♂♂; Opape Forest and Imatong Mountains, 8,000—10,000 feet, two ♂♂.

LYCAENIDAE.

Cupidesthes vidua sp. nov. (pl. iv, fig. 8).

Allied to *arescopa* B.-Bkr. (1910), and to *hilarion* Hulst. (1924).

♀. More resembles *hilarion* on the fore wing, but the blackish-brown apical area is less broad, and there is a short discoidal mark. The dark costal and outer margins are blacker than in *hilarion* or *arescopa*. Hind wing white. A submarginal crenate blackish line, thicker anteriorly; a marginal row of blackish, somewhat lunate, spots, the one in 2 being larger than the others; a fine black marginal line; fringe fuscous, white at the base. This hind wing marking resembles that of *mimetica* Druce (1910).

Underside white with fewer and smaller markings than in the allied forms. Markings weak, grey-brown. Fore wing with a discoidal spot, between the cell and apex an oblique series of four small rounded spots, and between these and the cell a similar kind of spot in 2 and one above it in 3. A well marked submarginal line, an indistinct ante-marginal line and a fine brown marginal line. Hind wing with two small, dark-brown costal spots, one near the base and one near the middle. A discoidal spot, a postdiscal series of five spots in 2—6; an obscure elongate spot below the cell; a submarginal crenate line, followed by some small ante-marginal spots, a fine brown marginal line; the usual metallic-scaled black and orange spots in 2 and at anal angle.

Length of fore wing., 20 mm.

Habitat.—South-east Angola: Moxico District, 4,000 feet, October, 1928, one ♀ taken by T. A. Barnes (holotype). Also one ♀ from Uganda, Maberera forest, taken by R. A. Dummer.

Euchryrops hawkeri sp. nov. (pl. iv, fig. 5, ♂).

According to Beth.-Baker (*Trans. Ent. Soc. Lond.*, 1922-23, p. 279), we should use the genus *Neochryrops* B.-Baker. At present we are unable to find any truly constant character by which to distinguish this genus from *Euchryrops*.

The former genus is praeoccupied and must be called *Lepidochryrops* Hedicke (1923) by those who care to use it.

The species *hawkeri* is closely allied to *nyasae* B.-Baker. (1923). It is distinguished from this and all other similar forms by the heavy black postdiscal spots on both wings below. The sexes are also very similar to each other.

♂. Upperside of wings blue, with broad dark margin; somewhat resembling the ♀ of *parsimon* Fbr. The blue colour is darker and brighter than in allied forms and the costal and distal margin of both wings are broadly fuscous-brown. Fore wing with a heavy black discoidal oblong spot, and a narrower one on the hind wing. Hind wing with the edge of the blue area paler between the veins, forming a series of indistinct submarginal spots; there is another row of smaller and indistinct submarginal spots which form the inner edge of four somewhat rounded black marginal spots. The usual orange spot in 2 is accompanied by a clouded orange anal spot.

Underside grey-brown, but darker than in allied forms. Fore wing with the discoidal and postdiscal spots black, edged with white. The postdiscal spots do not extend above vein 7, the anterior four form a slight curve; the fifth is shifted inward; and the sixth is narrow and directed distad. The marginal area is broadly brown, divided by a grey-white submarginal line broader at the veins, and there is a thin, white, marginal line. Between the postdiscal spots and the discal brown area is a series of grey-white spots. The fringe is fuscous-brown.

Hind wing markings somewhat as in *nyusae*, but there is no spot below the lower margin of the cell. Postdiscal and proximal spots black. The grey-white submarginal spots are smaller than in the allied forms, and not placed so close to the grey-white edges of the rounded marginal spots.

♀. Upperside with paler blue area which is reduced distally. On both wings the outer edge of the blue area is defined by whitish spots which are more marked in the hind wing. Underside as in ♂.

Length of fore wing, ♂ 21 mm., ♀ 22-23 mm.

Habitat.—South-east Angola: Moxico District, October, 1928, 4,000 feet, three ♂♂, four ♀♀. Taken by T. A. Barns.

Hypolycaena buxtoni Hew. *spurcus* subsp. nov.

♂. Differs from *buxtoni* Hew. (1874) as follows: Fore wing above more of a lighter blue which is somewhat copper-tinged. There is an indistinct but large blackish discal patch. Hind wing paler blue than in *buxtoni*, and the hair over the inner area is white.

Fore wing below with the postdiscal line straighter, and posteriorly farther removed from the submarginal line than in *buxtoni*. Hind wing with the lines more heavily marked, especially the postdiscal one.

♀. Fore wing above with extended basal brown area which reaches

the discoidal mark and is prolonged more distad below vein 2. The white area is traversed by a heavy postdiscal band which is slightly curved and usually joins the basal brown just below vein 2. Hind wing grey in the proximal area, with usually no white scaling. Underside as in the ♂.

Habitat.—Katanga, West Tanganyika, Rhodesia, Angola. In the Hill Museum, from West Tanganyika, Abercorn, 5.v.17, one ♂ (holotype); 2.vi.17, one ♀ (allotype); June, 1927, one ♀, taken by T. A. Barns; Luluvia River, east side of Marungu Plateau, 6,000 feet, February, 1922, one ♀, one ♂, taken by T. A. Barns; South Lufonso River, East Luvua Valley, Lake Mweru District, 5,000 feet, March, 1922, wet season, four ♂♂, one ♀, taken by T. A. Barns; South Luvua Valley Escarpment, five days north-east of Lake Mweru, 4,000—5,000 feet, March, 1922, middle wet season, three ♂♂, taken by T. A. Barns; Marungu Plateau, 7,600 feet, February, 1922, one ♀ taken by T. A. Barns; Katanga, Kakanda River, 21.ii.1920, one ♂, taken by G. S. Hutt; Kundelungu Plateau, 4,500—5,200 feet, June, 1922, one ♀, taken by T. A. Barns; Angola, Benguela Plateau, 5,000 feet, November, 1928, one ♂, taken by T. A. Barns.

Also in the Mus. Brit. as follows: Mpala District, Tanganyika, one ♂ (ex coll. Oberthur); Kavumu Hill, Kigoma District, 30.iv.22, two ♂♂, taken by C. H. B. Grant; Lualaba River, 15.v.07, 2,500—4,000 feet, one ♂ taken by S. A. Neave; North West Rhodesia, one ♀ taken by H. C. Dollman.

NEW FORMS OF BUTTERFLIES FROM SOUTH AMERICA.

By G. TALBOT.

PAPILIONIDAE.

Papilo cacicus Luc. *upanensis* subsp. nov. (pl. iii, fig. 1).

The female of *P. cacicus* has not hitherto been recorded from Ecuador, and male specimens have been associated with the typical Colombian form. Such males were from Western Ecuador. As the female before us is not the same as the Colombian one, it probably constitutes another race. It is to be hoped that some male specimens will be received from the same region by which we may adduce confirmatory evidence.

♀. Similar to the form *zaddachi* Dew. (1877) but larger and with longer tails. The reddish-brown discal band of the fore wing is posteriorly broader and reaches vein 2 where it is 18 mm. wide. The band in the cell is also much broader than in *zaddachi*, reaching vein 2 and measuring about 10 mm. in width, and about the same along the outer edge of the cell. The patches in 5 and 6 are slightly smaller than in *zaddachi*. Hind wing with smaller submarginal spots.

Length of fore wing, 59 mm.

Habitat.—East Ecuador: Chanala, 1,500 m., Rio Upano, one ♀. Received from the firm of Staudinger and Bang-Haas. There is a ♂ in the Hill Museum labelled "Ecuador," ex coll. Grosemith, which is slightly different from Colombian specimens. Upperside of fore wing with only the lower submarginal spot completely red, the one above it tinged with red, those in 4 and 6 larger than in Colombian specimens. On the underside the grey postdiscal band curved inward anteriorly.

The reddish-brown discal bands of the female closely resemble in form and colour the bands on the fore wing of *Brassolis astyra haenschii* Stich. (1902) (pl. iii, fig. 2), which occurs in the same region. Also in Ecuador there is the similarly patterned *Papilo euterpinus* G. and S.

The red female forms of *P. cacicus* are extremely rare in collections. In the British Museum, a single specimen is in the Adams coll. (ex Honrath), and in the Hill Museum there is the type specimen of *peruviana* J. and T. (1922), besides the specimen of *upanensis*.

ITHOMIINAE.

Ceratinia inana sp. nov.

This is possibly a form of *ninonia philidas* G. and S. (1880) which was taken with it at the same place.

♂, ♀. Very lightly scaled, with shadowy markings. Differs further from *philidas* in the more elongate submarginal spots on the fore wing, the more proximal position of the ill-defined postdiscal band, the black band on the hind wing placed close to the cell, and the submarginal spots on the underside yellow as on the upperside.

Habitat.—Colombia, probably the Bogota region. Susumuco, June and July, 1928, one ♂ (holotype); "Bogota" three ♀♀ (allotype).

Leucothyris zelica Hew. *cuneata* subsp. nov.

Intermediate between *zelica* Hew. (1856) from Ecuador, and *pagasa* Druce (1875).

♂, ♀. Fore wing with a somewhat wedge-shaped bar of black ground colour crossing the cell below vein 2. This very nearly cuts off a wedge-shaped basal patch of the cream-coloured area. On the hind wing below the two middle submarginal white spots are placed farther from the margin than in the two allied forms.

Habitat.—Colombia: Rio Dagua, 600 to 1,000 metres, February—May, one ♀ (holotype); El Tigre, Rio Tamana, Choco, 3,200 feet, February, 1909, one ♂, three ♀♀ (allotype).

NYMPHALIDAE.

Catagramma peristera mattogrossensis Talb. ♀.

♂. *Bull. Hill Mus.*, ii, p. 205 (1928).

When the description of this form was prepared, a single female specimen was overlooked. This resembles the ♀ of *pujoli* Ob. (1916), but the band of the fore wing is distally wider, and is not so broad on the costa as in *pujoli*. Hind wing without red, and marked below as in the typical ♂.

A single specimen in poor condition taken by Mr. C. L. Collenette at the Falls of Tombador, Matto Grosso, 2,000 feet, 7—9, viii, 1927.

ERYCINIDAE.

Argyrogramma pulchra sp. nov. (pl. iv, fig. 3 ♂, fig. 4 ♀).

Allied to *praestigiosa* Stich. (1929). The blue band of the fore wing in *pulchra* is broader and shorter, weakly lunate instead of S-shaped. The blue subapical spot lies somewhat farther from the apex. On the hind wing the apical area is not dusted with blackish. The ♀ resembles *venilia* Bates, but besides the paler colour, the blue subapical spot is characteristic of *pulchra*.

♂. Upperside of fore wing with black outer two-thirds and rufous-brown proximal area which reaches the upper margin of cell, extends to origin of vein 3, and has its edge somewhat frilled. A brilliant blue postdiscal band between veins 2 and 6, slightly lunate, posteriorly narrowed. A blue dot in the cell near its end. Two small blue subapical spots in 5 and 6, the one in 6 the larger, with a short blue line above it. A black dot below the cell near the base. A metallic silvery submarginal line which is broken at the outer subapical spot. Fringe marked with white in cellules 1b, 4, 5, and 6.

Hind wing rufous-brown with black markings. A few dots in the basal area. A heavy submarginal line, interrupted at the veins, and becoming thicker anteriorly. A second submarginal line, thicker than the other, not interrupted, and becoming a thin metallic silvery line. A black marginal line. Fringe marked with white between the veins.

Underside with blackish-brown ground-colour marked with pale-blue spots. Inner area of fore wing whitish for the greater part. Three blue spots in the cell, and two outside end of cell; a postdiscal series of 6, and a submarginal series of 6 blue spots. A spot at the apex silvery, and traces of a silvery submarginal line.

Hind wing with two blue spots in cellule 8, 3 in each of cellules 2—7, 5 in 1c, 1a and b striped with blue, 3 blue bars in the cell. A submarginal row of very pale blue spots formed by an interrupted line.

Abdomen dorsally and laterally rufous-brown, ventral surface fuscous. Thorax rufous-brown. Head, pectus, and legs fuscous marked with grey. Antennae missing.

♀. Both wings yellow, a little darker than in *macularia* Bdv., and in pattern resembling *venilia* Bates. Fore wing with a bright blue subapical spot in 5 within a black subapical area. Hind wing with the

black submarginal line which bears a silvery line placed farther from the margin than in *venilia*. Fringes black and marked with white as in the ♂.

Underside as above, but no blue spot on the fore wing, and in its place is an interrupted silvery-blue marginal line. The black spots are placed in a position similar to those on the underside of the ♂, marking the spaces between the blue spots in that sex. Head, thorax and abdomen pale yellow; pectus and legs as in the ♂. Antennae black, and with the exception of the club are ringed with grey-white on each segment.

Length of fore wing, ♂ 16 mm., ♀ 14 mm.

Habitat.—Santa Fé de Bogota, one ♂, one ♀, ex coll. E. Brabant.

Argyrogramma sticheli sp. nov. (pl. iv, fig. 1 ♂, fig. 2 ♀).

This species is dedicated to the eminent authority on Erycinidae, Dr. H. Stichel, who has kindly given me his opinion on the two species of *Argyrogramma* herein described. The specimen described here as the ♀ of *sticheli* is treated so with some hesitation, especially as its pattern is so unlike any other females known in the genus.

♂. Ground-colour black with rufous-brown proximal areas. The fore wing with bright blue spots as in *pulchra*. Upperside of fore wing with the proximal area extending from the inner margin to the cell, and slightly invading the cell, and distad to about half the distance between base and vein 2; its edge is irregular. A small rounded blue spot in the cell near its end. A blue postdiscal band, straighter than in *pulchra*, and a little narrower, from vein 6 to just below vein 2, and traversed by veins 3 and 4 which are not blue. Two blue subapical spots as in *pulchra*, but the one in 5 is larger than the other. A submarginal silvery-blue line.

Hind wing with the rufous proximal area extended well beyond the cell, its edge sharply defined. Two black dots at the base, three discal dots, and two black marks in 1b placed near the edge of the rufous area. A silvery-blue submarginal line.

Underside of the same colour and pattern as in *pulchra*, but the blue spots are smaller.

Head, thorax, abdomen, legs, and antennae as in *pulchra*.

♀. Upperside ochraceous-yellow with black margins and no spots on the yellow ground. Fore wing with broad black costal and broader distal border. The edge of the yellow ground irregular and in the cell

it is toothed. Three small blue subapical spots in 4—6, these spots somewhat nebulous, and the middle one larger than the others. A silvery-blue submarginal line interrupted at the veins.

Hind wing with narrower black distal border, the edge of the yellow area somewhat indented. A silvery-blue submarginal line interrupted at the veins.

Underside as above. Fore wing with the two lower subapical spots absent, and the fringe marked as in the ♂. Fringes of the hind wing without white markings.

Antennae as in the ♂. Head and pectus black, legs fuscous marked with grey. Thorax and abdomen ochraceous-yellow, the abdomen paler below.

Length of fore wing, ♂ 14 mm., ♀ 17 mm.

Habitat.—French Guiana: St. Laurent, Maroni River, July—September, 1915, one ♂ (holotype); “French Guiana,” one ♀.

A NOTE ON *CHARAXES BOUETI CENTRALIS*
NEUSTT. (1929).

By G. TALBOT.

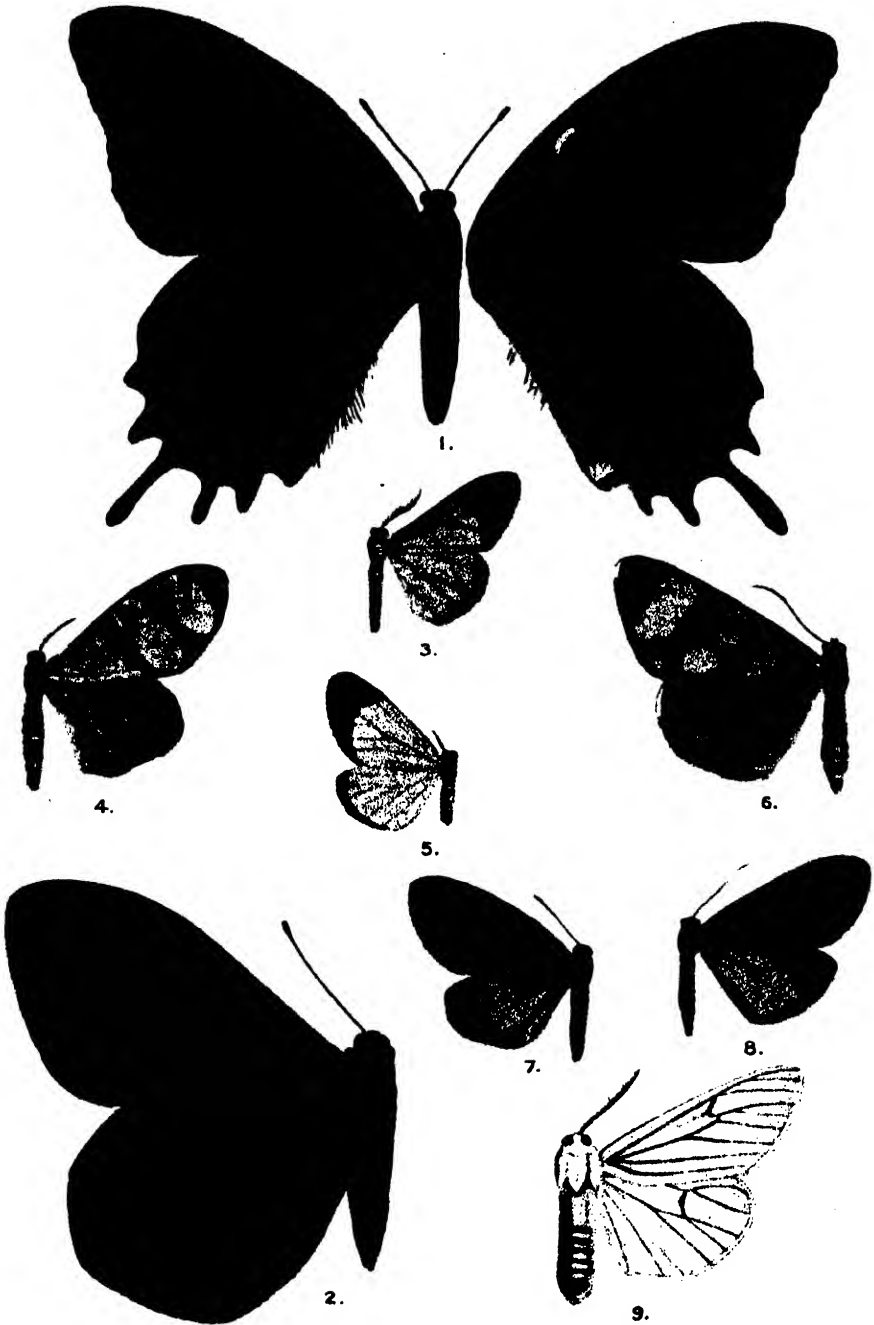
THE Hill Museum had acquired the type specimen of *Charaxes boueti centralis* Neustt. (*Int. Ent. Zeit.* 22, p. 391, 1929). This specimen was taken at Bongo in the French Congo. This place is apparently the village of that name which is on the right bank of the Congo River, quite close to Belgian territory. The insect is almost identical with *lasti* from Mombasa, and perhaps the only point from which it may be said to differ from this and other *boueti* forms is in the reduced size of the marginal brown spot below vein 2 of the fore wing, quite an unimportant character.

The presence of *lasti* so far to the west is of much interest, but as it does not encroach on the area occupied by the other races, *macclouni* Butl., and *boueti* Feisth., we may still regard it as a race of the latter.

The race *lasti* Sm. (1889) was noted by us in the *Entomologist*, ix, p. 109, 1927, and treated as a race of *boueti* Feisth.

We have dissected a specimen of *lasti* and one each of the two different forms of *macclouni*; the three are remarkably alike. The only noticeable difference is found in the produced apex of the valve. This part is identical in the two *macclouni* but in the *lasti* it is a little longer and more pointed. Another slight difference is the greater convexity of the lateral margin of the uncus in *lasti*. Such differences are, perhaps, only suggestive of a race.

The name *centralis* will probably sink to *lasti*, but further material of both forms is desirable before one can be quite sure.

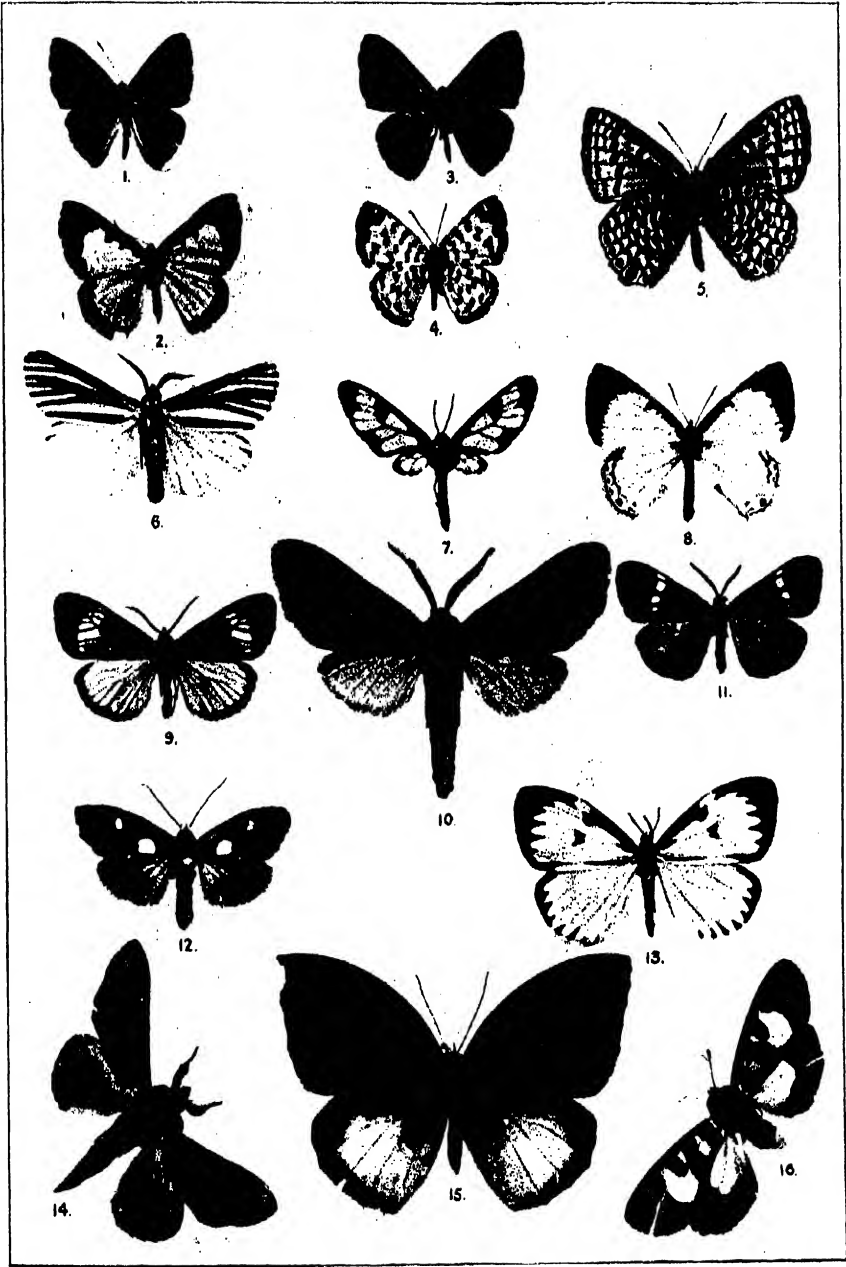


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A REVISION OF THE GENUS *PHYCIODES* Hübn.
(*Lepidoptera Nymphalidae*).

BY ARTHUR HALL, F.E.S.

(*Supplement to THE BULLETIN OF THE HILL MUSEUM, Vol. III.*)

(*Continued from p. 94.*)

46. *P. sosis* Godm. and Salv.

P. sosis Godm. and Salv., *Ann. Mag. Nat. Hist.* (5), ii, p. 262 (1878); *ibid.*, *Biol. Cent.-Am. Rhop.*, i, p. 204, t. 22, f. 11, 12 (1882); Rüb. in Seitz' *Macrolep.*, v, p. 442, t. 90, f. D1 (1913).

Exp. ♂ 30—34 mm.; ♀ 40 mm.

♂. Wings shaped as in *P. drymaea* Godm. and Salv. Upperside blackish-brown, not deep black. Fore wing with small spots arranged exactly as in *P. drymaea* but of a more yellowish-white tone. Hind wing without subbasal spots; discal band represented by a series of thin brownish-white lunules; postdiscal line thin, but extending from inner margin at least to vein 5, often to 6 or 7; submarginal lunules also thin but distinct.

Underside: Fore wing black-brown; base, apex and outer margin dark rufous-brown; yellowish white spots larger than above, the discal spots in 1b and 3 sometimes present but small. Hind wing as in *P. drymaea*, but of a more russet-brown tone; no trace of white discal spots.

♀. Similar to ♂ but larger, the spots on fore wing enlarged.

Habitat.—Honduras (Mus. Tring); Costa Rica: Irazu (type in Brit. Mus.), Rio Sucio; Panama: Chiriqui (2,000—3000 feet), Parida Island. Differs from all nearly-allied forms in the discal band of hind wing being reduced to thin, but connected lunules.

47. *P. sitalces* Godm. and Salv.

P. sitalces Godm. and Salv., *Biol. Cent.-Am. Rhop.*, i, p. 201, t. 21, f. 30, 31 (1882); Rüb. in Seitz' *Macrolep.*, v, p. 442, t. 88, f. 15 (1913).

(a) *P. sitalces saltator* subsp. nov.

P. sitalces sitalces, Godm. and Salv.

Exp. ♂ 38—42 mm.

♂. Upperside very similar to *P. drymaea*, Godm. and Salv.: spots on fore wing more ivory-white and a little larger, but the same in number and position except that submarginal spot in 3 is always well marked and there is often a smaller one below it; spots of discal band of hind wing as small as in those examples of *P. drymaea* which have them smallest; postdiscal line distinctly broken into spots.

Underside: Basal area of fore wing rather bright orange-brown, this colour extending almost to the discal spot in 3; white spots as in *P. drymaea*, but an indistinct postdiscal spot often appearing in 2. Hind wing a little lighter than in *drymaea*, the series of white spots representing the discal band more curved, the spots more lunular.

Habitat.—Guatemala: Chilasco. Type in British Museum.

A scarce and rather obscure species, apparently intermediate between *P. drymaea* and *P. texana*. I have only seen the six examples in the British Museum, all of which are ♂♂ and show practically no variation. The figure in the *Biologia* is good, but in that of Seitz the spots are too large.

(a) *P. sitalces saltator* subsp. nov.

♂. Upperside with white spots slightly larger than in *sitalces sitalces*, particularly those of the discal band of hind wing, which, however, remain well separated.

Underside: Basal area of fore wing rufous-brown, much duller and darker than in *sitalces sitalces*, almost as dark as in *P. drymaea*. Hind wing as in *sitalces sitalces*.

Habitat.—S. W. Mexico: Omilteme and La Soledad in Guerrero. Type and 3 co-types in British Museum.

Also very similar to *P. cortes* Hall, but the hind wing much darker beneath.

48. *P. texana* Edw.

Melitaea texana Edw., *Proc. Ent. Soc. Phil.*, ii, p. 81 (1863); *Eresia texana* Streck, *Cat.*, p. 119 (1878); Edw., *Can. Ent.*, xi, p. 127 (1879); *Phyc. texana* Godm. and Salv., *Biol. Cent.-Am. Rhop.*, i, p. 200 (1882); *Eresia texana* Holland, *Butt. Book*, p. 158, t. 18, f. 8, 9 (1898); *Phyc. texana* Rüb. in Seitz' *Macrolep.*, v, p. 442, t. 90, f. 05, 6 (1913); *Anthanassa texana* Barnes and McDunnough, *Check List.*, p. 10, n. 258 (1917).

= *Eresia smerdis* Hew., *Ex. Butt.*, iii, *Eresia*, t. 5, f. 33, 34 (1864).

(a) *P. texana seminole* Skinn., *Ent. News*, xxii, p. 412 (1911).

P. texana texana Edw.

Exp. ♂ 32—38 mm.; ♀ 36—40 mm.

♂. Upperside black; markings white or yellowish-white, sometimes with rufous subbasal spots. Fore wing with one or two small white spots at end of cell, often united to form a narrow bar; sometimes

a rufous bar at middle of cell and another beyond discocellulars; a small median spot in 1b; discal spot 2 small, isolated, the spots in 1b and 3 being absent, spots 4—6 also small, separated by the veins; postdiscal spots 1b and 4 about as large as discal spot 2, the latter with from one to three subcostal dots above it; submarginal spot in 3 small, the others absent. Hind wing sometimes with several small rufous subbasal spots and rufous median spots in 5—7; white discal band rather narrow, macular; postdiscal line obsolete; submarginal lunules white, thin, often partly obsolete, the one at anterior angle slightly thicker than the rest.

Underside: Fore wing basal half bright golden yellow, the outer edge of this area sharply defined; disc black; apex and outer margin whitish-grey, varied with brown; all white spots as above, and sometimes an additional one at middle of cell. Hind wing whitish-grey varied with ashy-brown; the usual brown lines and striae; white discal band distinct; blackish postdiscal spots present but not prominent; submarginal lunules whitish, often more or less obscured with ashy-grey.

♀. Similar to ♂ but spots above a little larger and fore wing often with very small submarginal spots in 2, 6 and 7.

Habitat.—Texas: Dallas, Fort Worth; Nebraska; Arizona: Palmerlee, Pima Co, Chiricahua Mountains, White Mountains; New Mexico; Mexico: Northern Sonora, Pinos Altos in Chihuahua, Ciudad Victoria, Sierra Madre de Tepic, Durango City, Jalisco, Morelia, Orizaba, Cuernavaca, Cuautla, Iguala, Acatlan, Ventanas, Venta de Zopilote, Milpas; Guatemala: Guatemala City, Barranca de Menocal.

An abundant species in Mexico, apparently flying throughout the year; local in Guatemala but abundant where found, chiefly at an elevation of 5,000—6,000 feet, whereas in the northern area of its range it descends to near sea level. Examples from Arizona and Texas generally have the rufous subbasal markings better developed than those from Mexico and Guatemala. Freshly emerged specimens often have the white spots slightly tinged with yellowish. The early stages are described by Edwards.

(a) *P. texana seminole* Skinn.

♂, ♀. Upperside: All white markings larger than in *texana texana*, slightly yellowish; rufous bars in cell and beyond discocellulars of fore wing broader, bright brick-red; cell-spots of hind wing distinct.

Underside as in *texana texana* but hind wing more whitish, discal band broader.

Habitat.—Georgia; Florida.

This form is rare in collections. A ♂ in the Adams collection in British Museum and one from Titusville, Florida, in the Tring Museum. Male armature of *P. texana texana* very similar to that of *P. drusilla*, the processes at apex of valve a trifle longer.

49. *P. hermas* Hew.

Eresia hermas Hew., *Ex. Butt.*, iii; *Eresia*, t. 5, f. 32 (1864); *Phyc. hermas* Rüb., in Seitz' *Macrolep.*, v, p. 444 (1913).

= *Eresia conferta* Feld., *Reise Nov. Lep.*, iii, p. 394, n. 578 (1867); *Phyc. conferta* Rüb., in Seitz' *Macrolep.*, v, p. 443, t. 90, f. D8 (1913).

= *P. brancodia* Schaus, *Proc. U.S. Nat. Mus.*, xxiv, p. 394 (1902); Rüb. in Seitz' *Macrolep.*, v, p. 442 (1913).

= *P. gisela* Rüb., in Seitz, l.c., p. 442 (1913).

= *P. aequatorialis* Rüb. in Seitz, l.c., p. 442, t. 90, f. C4 (1913).

Exp. ♂ 27—32, ♀ 32—40 mm.

♂, ♀. Fore wing shaped almost as in *P. frisia* Poey, the outer margin less excavated below vein 4 than in *P. drusilla* Feld. Upperside black; markings white or ivory-white, the subbasal spots sometimes slightly ferruginous. Fore wing with a small white spot at middle of cell, a transverse spot at end of cell, sometimes with a pale ferruginous double spot between them and a small round spot of the same colour at base of cell; a pale ferruginous bar beyond discocellulars, often obsolete; two white spots in 1b, below cell, often with a pale ferruginous double spot between them; discal spots 1b and 3 small, the former often double, rarely obsolete, spot 2 of medium size, spots 4—6 a little smaller than that in 2; postdiscal spots present in 1b, 2, 4, and 5, those in 2 and 5 smaller; rarely more than one subcostal dot above the latter; submarginal spot in 3 rather large, the others absent or that in 2 represented by a dot. Hind wing with a number of white or ivory-white subbasal and median spots, the one at end of cell slightly ferruginous; postdiscal line sometimes well marked and distinct, sometimes obsolete, always broken into linear spots when present; submarginal lunules fairly heavy.

Underside: Fore wing black; base ochraceous to about end of cell; apex and outer margin varied with brown and grey or yellow-grey; all white spots as above. Hind wing white or yellowish-white, more or less clouded with brown, with the usual fine brown lines and striae and

blackish postdiscal dots; a rather prominent white spot in cell and another at middle of costa; white discal band more or less distinct; submarginal lunules whitish, defined brown, often more or less overclouded.

Habitat.—Brazil: Para (Mus., Tring), Pernambuco (type, in Brit. Mus.), Bahia, Pena Blanca, Sao Paulo City, Campinas (700 feet), Itaparica, Chapada, Cuyaba; Paraguay: Sapucay; N. Argentina: Posadas, Corrientes, Resistencia; Ecuador (*teste* Röber).

Dated specimens January, March, May, September, December.

This species of many names may be separated from its near allies by the fore wing having two pairs of postdiscal spots placed one above the other, the lower pair near hinder angle, the upper pair between veins 4 and 6; the upper spot of one or the other pair is sometimes reduced to a dot but seldom altogether absent. Although widely distributed, the species is a local one. I have examined specimens from all the above localities except Ecuador and fail to find any local differences. There is, however, a fair amount of individual variation, as may be seen from Seitz' figs. of *conferta* and *aequatorialis*, the former representing the small and rather worn type ♂ of *P. conferta* Feld. and the latter a large, freshly emerged ♀, similar in all respects to those I have taken in South Brazil, so that I regard it as doubtful whether it came from Ecuador. Hewitson's fig. shows only the underside, and is not very good, hence several wrong determinations. The Central American specimens referred by Godman and Salvin to *P. hermas* belong in part to *P. ardys* and in part to *P. sitalces saltator*. Valve of *P. hermas* of the usual type, the processes at apex rather short. Uncus resembling that of *P. frisia* rather than that of *P. texana* or *P. ardys*, the end nearly straight, with several small external processes on each side. Saccus double.

50. *P. dracaena* Feld.

Eresia dracaena Feld., *Reise Nov. Lep.*, iii, p. 393, n. 577 (1867); *Phyc. dracaena* Rüb. in Seitz' *Macrolep.*, v, p. 442, t. 90, f. C3 (1913).

= *P. carigia* Schaus, *Proc. U.S. Nat. Mus.*, xxiv, p. 395 (1902); Rüb., in Seitz' *Macrolep.*, v, p. 439 (1913).

(a) *P. phlegias* Godm. and Salv., *Biol. Cent.-Am. Rhop.*, ii, p. 680, t. 108, f. 21, 22, ♂ (1901); Rüb., in Seitz' *Macrolep.*, v, p. 441 (1913); Schaus, *Proc. Zool. Soc.*, 1913, p. 346, t. 50, f. 9, ♀ (1913).

= *P. platytaenia*, Seitz' *Macrolep.*, v, t. 90, f. B5, ♂ (1913).

P. dracaena dracaena Feld. (pl. i, fig. 11, ♂).

Exp. ♂ 35—40, ♀ 42—45 mm.

♂. General pattern of *P. drusilla* Feld., but fore wing considerably more produced. Upperside black-brown; markings ochraceous-fulvous; both wings scaled with ferruginous at base, where some black lines become visible. Fore wing with transverse spot at end of cell, but no pale median spot in 1b; discal spots 1b and 3 very small, the former generally absent, the latter contiguous with spot 2; spots 4—6 rather small, contiguous; postdiscal spots 1b and 4 large, round, the former as large as, or larger than the discal spot in 2; two small subcostal spots near apex prominent, sometimes white; submarginal lunule in 3 distinct, the other submarginal spots often represented by linear marks. Hind wing discal band broader than in *P. drusilla drusilla*, straighter; postdiscal line usually continued to vein 6, where it joins the discal band; submarginal lunules thin but all distinct.

Underside: Fore wing blackish; base, apex and outer margin rather light greyish-brown; all spots as above but very pale ochraceous; no distinct submarginal lunules except the one in 3. Hind wing brownish-grey; brown lines and striae much more faintly marked than in *P. drusilla*; pale band of upperside faintly indicated; no dark postdiscal spots; submarginal lunules rather faint, greyish.

♀. Similar to ♂ but slightly larger and paler.

Habitat.—Colombia, "Bogota" (type, in Tring Mus.), San Rafael (3,500 feet), La Mesa (4,000 feet).

Although superficially resembling *P. drusilla*, this species seems, from the shape of the wings and the pattern of the hind wing beneath, to be really more nearly allied to *P. nebulosa* Godm. and Salv. I found it not uncommon at La Mesa and San Rafael in June and July, but it is a decidedly local species.

(a) *P. dracaena phlegias* Godm. and Salv.

♂. Upperside: Base of wings more blackish than in *dracaena dracaena*; markings a little deeper fulvous. Fore wing discal spot 1b present but small, contiguous with spot 2; also a small median spot in 1b; submarginal spot in 3 smaller, linear, the other submarginal spots absent. Hind wing discal band much narrower than in *dracaena dracaena*, about as wide as in *P. drusilla drusilla*.

Underside as in *dracaena dracaena* except that the discal spots of fore wing are more yellowish and the hind wing paler, with a more pronounced brownish blotch at middle of costa,

♀. Similar to ♂ but all markings above white; spots of fore wing beneath also white.

Habitat.—Honduras: Costa Rica, Peralta.

A rare form in collections. Type and one ♂ co-type in British Museum, one ♂ in coll. Hall, one ♀ in Tring Museum. The latter is an aberration in which discal spots 1 b—3 of fore wing are absent.

Seitz' fig. of the ♂ is better than that in the *Biologia*.

Valve of *P. dracaena dracaena* very similar to that of *P. drusilla*. Saccus (pl. iii, fig. 26) with two somewhat longer and more pointed projections. Uncus terminating in two broad projections separated by a wedge-shaped excavation, no hooks or spines.

51. *P. nebulosa* Godm. and Salv.

P. nebulosa Godm. and Salv., *Proc. Zool. Soc.*, 1878, p. 269; *ibid.*, *Biol. Cent.-Am. Rhop.*, i, p. 205, t. 22, f. 13, 14 (1882); Rüb. in Seitz' *Macrolep.*, v, p. 443, t. 88, f. 17 (1913).

(a) *P. subconcolor* Rüb., in Seitz, l.c., p. 441, t. 90, f. B1 (1913).

(b) *P. alexon* Godm. and Salv., *Ann. Mag. Nat. Hist.* (6), iii, p. 353 (1889), *ibid. Biol. Cent.-Am. Rhop.*, ii, p. 681, t. 108, f. 23—26, ♂, ♀ 1901; Rüb. in Seitz' *Macrolep.*, v, p. 442 (1913).

= *P. natalces* Dyar, *Proc. U.S. Nat. Mus.*, xlv, p. 279 (1913).

P. nebulosa nebulosa Godm. and Salv.

Exp. ♂ 33—38, ♀ 38—42 mm.

♂, ♀. Upperside black-brown; markings deep ferruginous, sometimes indistinct. Fore wing a narrow spot at end of cell; a median spot in 1b; a rather small discal spot in 2 and smaller ones in 4—6; small postdiscal spots in 1b and 4, and an indistinct linear submarginal spot in 3. Hind wing with from 1 to 3 subbasal spots and often small median spots in 4—6; discal band narrow, partly separated into somewhat lunular spots; prodiscal line generally distinct in 1b—3, then terminating abruptly; submarginal lunules thin but distinct. The fore wings are distinctly more produced than in *P. drusilla* Feld., the outer margin more excavated.

Underside: Fore wing blackish; base yellow-brown, with black lines in cell; spots as above but pale yellowish, median spots 1b and 3 being generally present but small, contiguous with spot 2; apex and outer margin dark rufous-brown, the apex irrorated with grey. Hind wing whitish-grey with fine brownish lines and striae; a brown patch at

middle of costal margin, from which an irregular brown median line crosses the wing; no dark postdiscal dots; submarginal lunules faint; middle of outer margin brownish.

Habitat.—Guatemala, Las Nubes (type, in British Museum), Escuintla (1,100 feet), Palin (2,500 feet), La Antigua (5,000 feet).

The deep ferruginous markings distinguish this race from all allied forms except *P. acesas castianira* Godm. and Salv., which is a much smaller form with shorter fore wing. It is decidedly scarce where it flies, as I have taken only six specimens during three trips to Guatemala, and the British Museum contains only two ♂♂. Dated specimens, July, August, December. Seitz' fig. is poor.

(a) *P. nebulosa subconcolor* Röh.

♂. Fully intermediate between *P. nebulosa nebulosa* and *P. nebulosa alexon*. Markings above as in *nebulosa nebulosa* but paler, especially on the fore wing, where the spots are of a somewhat whitish-brown tone and therefore much more distinct. Underside as in *nebulosa nebulosa* but a little paler.

Habitat.—Arizona (?): Mexico.

The type and five other ♂♂ in the Tring Museum are labelled "Benson, Arizona," but as that collection contains two other distinctly South Mexican species similarly labelled and evidently from the same source, I regard the locality as doubtful, especially as none of the North American collectors seem to have heard of it. There is a specimen in the British Museum from Mexico, and it is probable that the extreme south of that country is its true habitat.

(b) *P. nebulosa alexon* Godm. and Salv.

♂, ♀. Upperside: Fore wing with all the spots white; submarginal lunule in ♂ more distinct than in *nebulosa nebulosa*, and in the ♀ the other submarginal spots are represented by linear marks. Hind wing subbasal and median spots ferruginous, better defined than in *nebulosa nebulosa*; discal band, postdiscal line and submarginal lunules white. Underside as in *nebulosa nebulosa*, but spots of fore wing white. Hind wing paler, the dark blotch at middle of costal margin reduced, the white discal band of upperside faintly indicated.

Habitat.—Mexico, Cuernavaca, Rincon, Acaguizotla, Iguala, Cuautla (4,000 feet), San Luis Potosi. Type in British Museum. Dated specimens, June and July in coll. Hall.

Differs from most allied forms in the contrast between the ferruginous subbasal spots and white discal and outer markings of the hind wing above, a character well shown in the excellent figures in the *Biologia*. Like the other races, it is quite a rare insect where it occurs. *P. natalces* Dyar, described from a single ♀ taken at Rascon in San Luis Potosi in August seems to be synonym to *alexon*, but in the somewhat lengthy description there is no reference whatever to its affinities with any other species.

Male armature of *P. nebulosa nebulosa* very similar to that of *P. drusilla*, but the two processes at tip of valve longer.

52. *P. ithra* Kirby.

Neptis ithra Kirby, *Syn. Cat.*, p. 252, n. 54 (1871); *Phyc. ithra* Kirby, in Hübner, *Samml. Ex. Schmiett.*, n. ed., p. 18 (1900).

— *Acca. hera* Hübner. (non *Pap. hera* Cram.) *Samml. Ex. Schmiett.*, ii, t. 44, f. 1—4 (1806).

— *Argynnis ianthe* Godt. (non *Pap. ianthe* Fabr.), *Ency. Meth.*, ix, *Suppl.*, p. 818 (1823); *Phyc. ianthe* Staud., *Ex. Schmiett.*, i, p. 92 (1888); *Eresia ianthe* Holland, *Butt. Book*, t. 18, f. 12 (1898); *Phyc. ianthe* Rüb. in Seitz' *Macrolep.*, v, p. 443, t. 90, f. D9, E1 (1913).

= *P. atra* Rüb., in Seitz, l.c., p. 443, t. 90, f. B7, C8 (1913).

(a) *P. ithra rufocincta* Hall, *Entomologist*, vol. lxi, p. 11 (1928) (*Argentina*).

P. ithra ithra Kirby.

Exp. ♂ 35—40, ♀ 38—47 mm.

♂. Upperside deep black; markings pure white. Fore wing a spot at end of cell; a small median spot below it in 1b; discal spots 1b and 3 small (the former often absent), contiguous with spot 2; discal spot 4 rarely present, those in 5 and 6 small; a round post-discal spot in 4, and 2 small subcostal spots above it; no postdiscal spots in 1b—3; submarginal spots absent or that in 1b represented by a dot. Hind wing discal band rather narrow, straight; postdiscal line absent; a well marked submarginal spot in 7 above anterior angle; the other submarginal lunules absent or faintly indicated.

Underside: Fore wing bright yellow from base to end of cell: disc black; outer margin dark-brown varied with whitish; white spots nearly as above but there is an additional small spot in the cell and from 5 to 7 submarginal spots, that in 1b being always the largest; roundish. Hind wing, basal half white, with fine dark-brown lines and outlined spots;

discal band as above; outer area dark brown, more or less varied with whitish; black postdiscal spots prominent; submarginal lunules white, prominent, only those in 4 and 5 sometimes clouded with brown.

♀ similar to ♂ but white spots a little larger; fore wing above with from 3 to 6 submarginal spots; hind wing submarginal lunules more distinct, sometime pure white.

Habitat.—Brazil: Rio Janeiro, Tijuca, Minas Geraes, São Paulo City, Alto da Serra, Ponta Grossa, Uniao da Victoria, Santa Catharina, Rio Iguassu, Santa Maria, Rio Grande do Sul; Uruguay: Monte Video; Paraguay: Sapucay, Encarnacion, Asuncion; Argentina: Buenos Ayres, Cordoba, Corrientes, Entre Rios, Sierra de Aconquija, Tucuman, Salta; Bolivia: Torochito (coll. Brit. Mus.)

Dated specimens, November to March inclusive; elevations, sea-level to 5,000 feet. Differs from all allied species except *P. texana* Edw. in the bright yellow basal area of the fore wing beneath, and from *texana* in the absence of the postdiscal spot in 1b. A very common species, often found in collections under the name of *P. ianthe* Fabr. In general it does not vary much. Specimens having all the submarginal lunules of hind wing, pure white are exceptional, and I have one aberration with the spots distinctly yellowish.

P. atra Rüb. is presumably a misprint for *ithra*; at any rate the specimens figured in Seitz under this name are quite typical.

(a) *P. ithra rufocincta* Hall (pl. i, fig. 3, ♀).

♂, ♀. Fore wing above with a double ferruginous spot at middle of cell and sometimes a discoidal bar of the same colour. Hind wing with a broad ferruginous postdiscal stripe placed close to the submarginal lunules or entirely replacing them; a white spot in the cell.

Habitat.—Argentina: Cordoba Hills (1,000—3,000 feet). Type in coll. Hall. This form seems to have a certain amount of local constancy, five specimens out of twelve from the Cordoba Hills belonging to it. Male armature of *P. ithra ithra* differing from all allied species in the saccus having only a single very long projection. Valve of the usual shape, with moderately long process at apex; the large thorn-like process below apex more or less serrated.

53. *P. orticas* Schaus.

P. orticas Schaus, *Proc. U.S. Nat. Mus.*, xxiv, p. 394 (1902); Rüb. in Seitz' *Macrolep.*, v, p. 445 (1913).

(a) *P. zamora* Hall, *Entomologist*, 1917, p. 161.

P. orticas orticas Schaus.

Exp. ♂ 35—38, ♀ 38—42 mm.

♂, ♀. Upperside blackish-brown; markings white or yellowish-white. Fore wing a small or obsolete spot at end of cell; no subbasal or median spots in 1b; discal spots 1b—3 fused together to form a large trifold patch or short band, spots 4—6 also contiguous, fairly large; no postdiscal spots in 1b, but two small ones in 4 and 5 and two subcostal dots above these; submarginal spots absent. Hind wing discal band rather broad, straight, entire; no postdiscal line; submarginal lunules very slender or obsolete.

Underside: Fore wing yellow-brown from base to beyond end of cell; disc black; white spots as above; outer margin brown, with a dark submarginal line and some white scaling at apex. Hind wing whitish, with fine brown lines on basal area; discal band more or less distinctly indicated; outer area light brown with indistinct dark brown postdiscal spots; submarginal lunules greyish, indistinct, bordered outwardly by a dark line.

Habitat.—Brazil: Castro in Parana (type), Rio Janeiro, Sao Paulo, Minas Geraes; Argentina: Entre Rios (coll. Brit. Mus.) Type in U.S. National Museum.

A rather isolated species, agreeing with *P. fulgora* Godm. and Salv., in the shape of the wings and the absence of a postdiscal spot in 1b of fore wing, but in other respects perhaps more nearly allied to *P. teletusa* Godt.

(a) *P. orticas zamora* Hall (pl. i, fig. 13, ♂).

♂. Upperside: markings creamy-yellow or ochreous.

Fore wing spot in cell larger, more distinct; discal patch 1b—3 broader, more rounded; no postdiscal spots in 4 and 5, but a prominent orange-yellow submarginal spot in 3 and a smaller, indistinct one above it in 4.

Underside as in *orticas orticas*, but hind wing a little darker.

♀ similar to ♂ except that on the fore wing, the postdiscal spots in 4 and 5 are marked in orange-yellow like the submarginal spots.

Habitat.—Venezuela (?); Brazil: Rio Janeiro, Espiritu Santo, Sao Paulo, Minas Geraes. Type in coll. Hall.

I described this form from a pair sent to me by the late Herr Bang-Haas labelled "Venezuela," but there is now reason to doubt the correctness of this locality. The British Museum contains specimens

from the Brazilian localities given above, so that it is possible that it is a mere colour—or seasonal form of *orticas*. None of the specimens of *P. orticas* which have come under my notice are dated.

54. *P. fulgora* Godm. and Salv.

P. fulgora Godm. and Salv., *Ann. Mag. Nat. Hist.* (5), ii, p. 261 (1878); *ibid. Biol. Cent.-Am. Rhop.*, i, p. 206, t. 22, f. 17, 18 (1882); Rüb. in Seitz' *Macrolep.*, v, p. 445, t. 90, f. F6 (1913).

= *P. levana* Rüb. in Seitz, l.c., p. 440, t. 88, f. H7, ♀ (1913).

Exp. ♂ 30—34, ♀ 38—40 mm.

♂. Fore wing more produced than in *P. drusilla* Feld. Upperside blackish-brown; markings fulvous. Fore wing a transverse spot at end of cell; no median spot in 1b; discal spots 1b—3 fused together so as to form a large circular blotch and spots 4—6 also united to a large subcostal blotch of about the same size; postdiscal spots all absent except the two subcostal dots near apex which are pure white; a submarginal lunule in 3. Hind wing, discal band rather narrow, entire, paler than the markings of fore wing, somewhat yellowish; postdiscal line distinct posteriorly, sometimes obsolete anteriorly; submarginal spot above anterior angle pure white, prominent, the other submarginal lunules thin and faintly marked in fulvous.

Underside: Fore wing blackish; cell wholly fulvous, crossed by four black lines; the two discal blotches larger than above, more or less confluent; apex and outer margin brown, with four white subcostal dots before apex; submarginal spot in 3 white, the other submarginal spots small and obscure.

Hind wing whitish-brown, with the usual fine brown linear markings; discal band white, fairly well defined; the black postdiscal spots well developed; submarginal lunules whitish, the anterior one larger.

♀. Upperside more brownish than in ♂. Fore wing with the discal spots all united so as to form a broad unbroken band 5—6 mm. wide and extending from costa to inner margin; cell-spot larger than in ♂, and sometimes a median spot below it in 1b; in addition to the submarginal lunule in 3, which is large, there are small submarginal spots in all the other interspaces, those at apex being white, like the subcostal dots. Hind wing discal band posteriorly narrower than in ♂; postdiscal line much broader; submarginal lunules well-marked, yellowish; outer margin bordered with ferruginous.

Underside much paler than ♂. Fore wing ferruginous-brown in

disc; markings as in ♂ but not so well defined; hind wing whitish discal band only faintly indicated.

Habitat.—Costa Rica: Rio Sucio (type in Brit. Mus.), Irazu, Cache, Orosi.

A scarce species, the sexes of which differ more than is usual in this group. The ♂ may be known from all the nearly allied species by the absence of postdiscal spots on the fore wing and the white subcostal spot on hind wing; the ♀, which is fairly well figured in Seitz under the name of *P. levana*, is not much like any other species. My examples were taken by Fassl on Mount Orosi at 1,200 metres, no dates.

55. *P. acesus* Hew.

Eresia acesus Hew., *Ex. Butt.*, iii, *Eresia*, t. 6, f. 48, 49, ♀ (1864); *Phyc. acesus* Rüb. in Seitz' *Macrolep.*, v, p. 440 (1913).

= *P. annita* Staud., *Ex. Schmett.*, i, p. 92, t. 36, ♂ (1888); Rüb. in Seitz' *Macrolep.*, v, p. 443, t. 90, f. D5, 6, ♂ (1913).

(a) *P. castianira* Godm. and Salv., *Trans. Ent. Soc.*, 1880, p. 131, n. 79, t. 4, f. 10, ♂.

P. acesus acesus Hew. (pl. 1, fig. 2, ♂).

Exp. ♂ 27—32, ♀ 35—38 mm.

♂. Wings shaped as in *P. ptolyca* Bates. Upperside dark brown with paler brown, largely indistinct markings. Fore wing often without markings or with only small brown postdiscal spots in 1b and 4; in more strongly marked examples there are faint traces of small discal spots in 1b—3 and 4—6, arranged in two patches as in *P. drusilla*, &c., and also a small submarginal spot in 3. Hind wing with a discal series of thin lunules which tend to unite along the veins with the postdiscal line so as to form rings; submarginal lunules thin but distinct, forming a continuous waved line.

Underside: Fore wing basal area pale brown with black lines; disc black; discal blotches 1b—3 and 4—6 brownish ochreous, larger than above and sharply defined; postdiscal spots in 1b and 4 distinct; outer margin ferruginous-brown, scaled with grey at apex. Hind wing brown, varied with ashy-grey; the usual fine brown linear markings; an irregular dark brown median line, rather heavy near costa; no dark postdiscal spots; submarginal lunules indistinct.

♀. Larger than ♂. Upperside a little paler, with faint traces of

subbasal spots. Fore wing discal patches 1b—3 and 4—6 pale brown, distinct but ill-defined; postdiscal spots in 1b and 4 paler, more prominent, the latter followed by two small subcostal spots. Hind wing as in the ♂ but markings paler, the discal rings thickened based.

Underside as in the ♂.

Habitat.—Venezuela: Caracas (3,000 feet), Merida (4,000 feet). Type in British Museum.

This species is intermediate between the group of *P. drusilla* and that of *P. delphia*, but the under surface shows more affinity with the former group.

P. acesas acesas is very local but common where found. Dated specimens, March, September, and October. Staudinger's fig. of the ♂ under the name of *P. annita* is so poor as to be unrecognizable, whilst Seitz' figures hardly seem to represent this species at all.

(a) *P. acesas castianira* Godm. and Salv.

♂. Upperside with markings as in the more strongly marked specimens of *acesas acesas* but of a reddish-tawny colour and much more distinct; fore wing discal blotches 1b—3 and 4—6 larger and better defined; hind wing discal lunules heavier, not forming such complete rings with the postdiscal line; a median series of small spots and two spots in cell.

Underside as in *acesas acesas*.

♀. Unknown.

Habitat.—Northern Colombia: Manaure. Type in British Museum.

This form recalls *P. nebulosa nebulosa* Godm. and Salv. in the colour of its markings but the wings are much shorter and less produced. I have only seen the three specimens in the British Museum.

Male armature (pl. iii, fig. 5) of *P. acesas acesas* showing no marked difference from that of *P. drusilla*, to which group it is distinctly more nearly related than to that of *P. delphia*.

56. *P. atronia* Bates.

Melitaea atronia Bates, *Ent. Mo. Mag.*, iii, p. 133, No. 102 (1866); *Phyc. atronia* Godm. and Salv., *Biol. Cent.-Am. Rhop.*, i, p. 206, t. 22, f. 19, 20, ♂, 21, ♀ (1882); Rüb. in Seitz' *Macrolep.*, v, p. 443, t. 88, f. I 6, ♂ (1913).

— *Eresia sydra* Reak., *Proc. Ac. Nat. Sci. Phil.*, 1866, p. 335.

= *Eresia obscurata* Feld., *Verh. Zool. Bot. Ges.*, 1869, p. 471 ;
Phyc. obscurata Rüb. in Seitz' *Macrolep.*, p. 441, t. 90, f. A6 (1913).

= *P. otaues* Butl. and Druce (non Hew.), *Proc. Zool. Soc.*, 1874,
 p. 348.

= *P. cassiopea* Rüb. in Seitz' *Macrolep.*, v, p. 441, t. 90, f. A4,
 ♂ (1913).

(a) *P. argentea* Godm. and Salv., *Biol. Cent. Am. Rhop.*, i, p. 207
 (1882) ; *ibid.*, l.c., ii, p. 681 (1901) ; Rüb. in Seitz' *Macrolep.*, v, p. 443
 (1913).

(b) *P. cassiopea* Godm. and Salv., *Ann. Mag. Nat. Hist.* (5), ii,
 p. 262 (1878) ; *ibid. Biol. Cent.-Am. Rhop.*, i, p. 207, t. 22, f. 22, 23, ♀
 (1882).

(c) *P. diallus* Godm. and Salv., *Ann. Mag. Nat. Hist.* (5), ii, p. 260
 (1878) ; *ibid. Biol. Cent.-Am. Rhop.*, i, p. 207, t. 22, f. 24, 25, ♀ (1882) ;
 Rüb. in Seitz' *Macrolep.*, v, p. 441, t. 90, f. A5, ♂ (1913).

= *P. chromis* Godm. and Salv., *Ann. Mag. Nat. Hist.* (5), ii, p. 260
 (1878).

= *P. albofascia* Rüb. in Seitz' *Macrolep.*, v, p. 441 (1913).

= *P. albifascia* Seitz, l.c., t. 90, f. B6, ♀ (1913).

P. atronia atronia Bates.

Exp. ♂ 30—36, ♀ 38—44 mm.

♂. Fore wing truncate at apex ; outer margin moderately excavated
 below vein 4. Upperside dark brown. Fore wing with ill-defined spots
 of paler brown arranged as follows : one or two spots in cell, a median
 spot in 1b, discal spots in 1b, 2 (these two well separated) and 4—6, small
 postdiscal spots in 1b and 4, the latter often with two subcostal dots
 above it, and a small submarginal spot in 3 ; in some examples hardly
 any of the markings are visible, whilst in others the brown spots on the
 basal half are moderately distinct and discal spot 4—6, postdiscal spots in
 1b and 4 and the two subcostal dots are all whitish and prominent.
 Hind wing dull sericeous area between costa and vein 4 almost blackish,
 immaculate ; the rest of the wing with more or less distinct traces of
 lighter brown subbasal and median spots, thin discal and postdiscal
 lunules (sometimes tending to form rings in 1b—3), and a lunulated
 submarginal lines.

Underside : Fore wing dark brown ; apex and outer margin more
 ferruginous, with some greyish scaling at apex ; most of the markings
 of upperside only faintly indicated, but postdiscal spots in 1b and 4

generally distinct, more or less whitish. Hind wing dark grey-brown with faintly marked brown lines; a darker patch on costa, from which a more or less distinct median line crosses the wing; postdiscal spots brown or obsolete; submarginal lunules faint, the dark line distal to them generally better marked.

♀. Considerably larger than ♂; general pattern as in *P. drusilla* Feld. Upperside blackish-brown; markings ochraceous-fulvous, those on basal area more or less ferruginous. Fore wing indistinct subbasal spots in cell and 1b; a small median spot in 1b; discal spot in 2 fairly large, sometimes with smaller ones contiguous with it in 1b and 3, spots 4—6 of medium size; round postdiscal spots in 1b and 4, a submarginal spot in 3, and two small subcostal spots. Hind wing with ferruginous subbasal and median spots in cell and 4—6; fulvous discal band about as broad as in *P. drusilla*, entire or slightly macular; postdiscal line distinct, joining the discal band at vein 6 when complete; submarginal lunules well marked.

Underside: Fore wing more or less broadly yellow-brown at base; disc blackish; outer margin ferruginous-brown with whitish-grey scaling at apex; all spots as above but paler, the outer ones whitish. Hind wing as in the ♂ but paler, more whitish-brown.

Habitat.—Mexico: Atoyac, Cordoba, Orizaba, Omealca, Jalapa; Guatemala: Duenas (type in British Museum), Zapote, Escuintla, Palin, Amatitlan, Volcano of Santa Maria, Retalheuleu; Nicaragua: Chontales; Costa Rica: Juan Viñas, Cache, Turrialba. Dated specimens, January, April, June to December. Found at elevations of 1,000 to 5,000 feet, the ♂♂ moderately common but the ♀♀ rare.

P. atronia is a rather variable insect, the forms of which were divided by Godman and Salvin into five species (!), but they eventually suppressed one and admitted that they could only differentiate three others in the female sex. From the material now available we are only able to recognize two subspecies, in one of which, however, several individual forms have received names. Males of *atrontia atronia* show absolutely no constant differences between specimens from Mexico, Guatemala and Costa Rica, but whereas the more strongly marked examples are in a minority in the two first-named countries they seem to preponderate in Costa Rica. Seitz' fig. under the name of *P. cassiopea* is a good representation of an average ♂, but his fig. of *atrontia* is not good. The ♀♀ differ so much from the ♂♂ that their relationship was not recognized until Mr. G. C. Champion took the paired sexes: they resemble the ♂♂, however, upon the underside of the hind wing.

(a) *P. atronia atronia* f. *argentea* Godm. and Salv.

♂, ♀. Only differs from *atrontia atronia* in the hind wing, being more or less irrorated with whitish beneath.

Habitat.—Mexico: Atoyac, Orizaba, Jalapa, Omealca; Guatemala: Choctum (type, in British Museum), Solola, Polochic Valley; Nicaragua: Chontales.

A weak form which can scarcely retain a name. In the type ♂ the hind wings beneath are a little whiter than in normal examples, but I should not call them "silvery," as stated in the original description, whilst the type ♀ hardly differs from that of *atrontia atronia*. I have taken both forms together at Orizaba.

(b) *P. atronia atronia* f. *cassiopea* Godm. and Salv.

♀. Differs from the ♀ of *atrontia atronia* in having all the fulvous markings replaced by white ones and the ferruginous subbasal spots indistinct or absent.

Habitat.—Mexico: Jalapa; Guatemala; Escuintla; Costa Rica: Cache, Juan Vinas. Type in British Museum.

Godman and Salvin regarded this form as a local race, as they knew it only from Costa Rica, but I have taken similar examples both in Mexico and Guatemala. These latter have the white spots rather smaller than in Costa Rican specimens, but as they are also smaller than in yellow-spotted specimens from the same localities the difference is probably only individual. I have also a ♀ taken by me at Teocelo, Mexico, in which the spots are pale yellow and very small, the discal band of hind wing being broken into spots as in *P. ardys* Hew. In the Tring Museum there is a ♀, also from Mexico, in which the markings are all brownish and obscure, almost as in the ♀ of *P. otaues* Hew.

(c) *P. atronia diallus* Godm. and Salv.

♂. Fore wing above with brown discal spots 1b—6 larger than in *atrontia atronia*, more diffused, indistinct.

♀. Upperside: Fore wing with pure white spots; discal spots 4—6 much larger than in *atrontia atronia* ♀, partly or entirely united with spots 1b—3 so as to form a more or less continuous band, angled at vein 4; postdiscal and submarginal spots as in *atrontia* ♀ f. *cassiopea*. Hind wing discal band reduced to a series of whitish lunules clouded with brown; postdiscal line dark red, sometimes a little whitish

posteriorly; submarginal lunules white, slightly clouded with brown but distinct.

Underside as in *atronia* ♀ f. *cassiopea* but with larger white spots on fore wing.

Habitat.—Panama: Chiriqui. Type in British Museum.

The differences in the ♂ may not be constant, but all Chiriqui ♀ ♀ seem to belong to this curious form.

Valve of *P. atronia atronia* of the same type as in the *P. drusilla* group, the two claw-like processes at apex distinct. Uncus shaped like a truncated cone, nearly straight. Saccus with two rather pointed projections.

57. *P. otares* Hew.

Eresia otares Hew., *Ex. Butt.*, iii, *Eresia* t. 6, f. 47 (1864); *Phyc. otares* Godm. and Salv., *Biol. Cent.-Am. Rhop.*, i, p. 208, t. 22, f. 28, 29, ♂ (1882); Rüb. in Seitz' *Macrolep.*, v, p. 440, t. 88, f. H5 (1913).

(a) *P. sopolis* Godm. and Salv., *Ann. Mag. Nat. Hist.* (5), ii, p. 262 (1878); *ibid.*, *Biol. Cent.-Am. Rhop.*, i, p. 209, t. 22, f. 30—32, ♂, ♀ (1882); Rüb. in Seitz' *Macrolep.*, v, p. 440, t. 88, f. I 4 (1913).

(b) *P. cyno* Godm. and Salv., *Ann. Mag. Nat. Hist.* (6), iii, p. 354 (1889); *ibid.*, *Biol. Cent.-Am. Rhop.*, ii, p. 680, t. 108, f. 27—29, ♂, ♀ (1901); Rüb. in Seitz' *Macrolep.*, v, p. 440 (1913).

P. otares otares Hew.

Exp. ♂ 27—33, ♀ 40 mm.

♂. Fore wing very short, the outer margin slightly excavated below vein 4. Upperside: Fore wing dark brown, sometimes almost immaculate; in other examples there are rather small pale ochreous postdiscal spots in cellules 1b and 4; more rarely two small subcostal dots above these, small postdiscal spots in 5 and 6, a spot in 2 and another at end of cell, all brownish. Hind wing covered with dull sericeous, blackish scales, except a narrow marginal border of uniform width, which is dark brown, rarely with faint traces of a paler submarginal line.

Underside: Fore wing black; base narrowly yellow-brown with black lines in cell; pale spots much as above; outer margin brownish, with greyish scaling at apex. Hind wing brown, variegated with yellowish and grey-brown; some obscure dark-brown lines; postdiscal spots and submarginal lunules obscure.

♀. Considerably larger than ♂. Shape and pattern of the *drusilla*

group but markings above brown or whitish-brown, ill-defined. Fore wing two small spots at apex of cell; a median spot in 1b; a rather small discal spot in 2 and still smaller ones in 4—6; postdiscal spots in 1b and 4, with two subcostal dots above the latter, and an obscure submarginal spot in 3. Hind wing with obscure ferruginous spots on basal area; a median band of pale brown spots, separated by the veins; postdiscal line faintly marked; submarginal lunules light brown, thin but distinct.

Underside: Fore wing blackish-brown; base rufous-brown; all spots of upperside reproduced in brownish-white, larger, with an additional subbasal spot in cell, another in 1b and sometimes extra postdiscal spots in 2 and 3. Hind wing as in the ♂ but paler, the dark postdiscal spots and pale submarginal lunules more distinct.

Habitat.—Western Guatemala: Duenas, Zapote, Palin (2,500 feet), Moran (4,000 feet), Amatitlan (3,500 feet), Volcano of Santa Maria (5,000—6,000 feet). Type in British Museum.

Dated specimens, July, August, September, October.

A rather scarce species, the ♀ ♀ very rare. The ♂ is fairly well figured in the *Biologia* but the figs. of Hewitson and of Seitz are unsatisfactory. The ♀ has not been previously described.

Some ♂ ♂ show sericeous patches also on the fore wing in cellules 1b—3, whilst in others these are absent. This appears to be due to the way in which the scales are set, as I can detect no difference in the scales themselves. On the hind wing, on the other hand, the majority of the scales are distinctly different, the ends not being dentate.

(a) *P. otanes sopolis* Godm. and Salv.

♂. Upperside of fore wing more strongly marked than in *otanes otanes*; discal spots in 2 and 4—6 and postdiscal spots in 1b and 4 yellowish, distinct. Hind wing and under surface as in *otanes otanes*.

♀. Upperside recalling the ♀ of *P. drusilla aethes* Bates. Fore wing with all the markings pale yellow, larger than in *otanes otanes*; discal spot in 2 bordered by small contiguous spots in 1b and 3. Hind wing ferruginous subbasal spots as in *otanes otanes* ♀; discal band pale yellowish, broader and less macular; postdiscal line and submarginal lunules also yellowish, better defined. Underside as in *otanes otanes* ♀ but spots on fore wing larger, more whitish.

Habitat.—Eastern Guatemala: Choctum, Purula, San Cristoval (4,000 feet), Sinanja. Type in British Museum.

The existence of different subspecies in Eastern and Western Guatemala is unusual, but the present race is constant in the five pairs I have examined. My examples were taken in December.

(b) *P. otanes cyno* Godm. and Salv.

♂. Similar to the same sex of *otanes sopolis* but discal spots in 2 and 4—6 of fore wing above larger and hind wing beneath a little paler, the markings more distinct.

♀. Fore wing above marked as in *otanes sopolis* ♀ but all the spots pure white, discal spots 4—6 larger. Hind wing subbasal spots bright rufous, large; median band whitish, narrow; postdiscal line and submarginal lunules also whitish. Hind wing beneath more greyish than in *otanes sopolis* ♀.

Habitat.—Mexico: Orizaba, Cuesta de Misantla.

A rare form, one ♂ (type) in British Museum; one ♂ in Tring Museum; ♀ (allotype) in coll. Schaus. The female has a curious resemblance to the same sex of *P. atronia diallus*.

Valve of *P. otanes otanes* very similar to that of *P. atronia*, the two processes at apex rather shorter. Saccus with two longer projections. Uncus very small, almost subcylindrical, without hooks or spines.

58. *P. fulviplaga* Butl.

P. fulviplaga Butl., *Cist. Ent.*, i, p. 77 (1872); *ibid.*, *Lep. Ex.*, t. 63, f. 2, ♂ (1874); Butl. and Druce, *Proc. Zool. Soc.*, 1874, p. 348; Godm. and Salv., *Biol. Cent.-Am. Rhop.*, i, p. 208, t. 22, f. 26, 27, ♀ (1882); Rüb. in Seitz' *Macrolep.*, v, p. 441, t. 90, f. A1, 2, ♂ (1913).

= *P. crithona* subsp. *stenotaenia* Rüb. in Seitz, l.c., p. 440, t. 89, f. K8 (1913).

Exp. ♂ 30—34, ♀ 38—42 mm.

♂. Wings shaped as in *P. otanes* Hew. Upperside: fore wing dark brown; a short, trifold, orange-yellow subapical band formed by contiguous discal spots in 4—6, the band about 3 mm. wide; small yellow postdiscal spots in 1b and 4, and an ill-defined submarginal spot in 3; sometimes small yellowish postdiscal spots in 2 and 3, and more rarely an indistinct pale bar at end of cell. Hind wing covered with dull sericeous black scales, leaving only a narrow marginal border of dark brown, sometimes bordered internally by a narrow yellowish submarginal line. Underside very similar to *P. otanes* Hew. but fore wing with yellow subapical band as above, clearer yellow postdiscal

spots in 1b and 4 and a submarginal lunule in 3; hind wing with rather brighter and clearer markings.

♀ larger than ♂. Upperside dark brown, slightly rufous. Fore wing sometimes with two small spots at end of cell and a median spot in 1b; yellow subapical band a little broader than in the ♂, followed by distinct yellow discal spots in 2 and 3 and sometimes a small one in 1b; postdiscal spots in 1b and 4 as in ♂; submarginal spot in 3 more distinct, with a smaller one below it in 2. Hind wings with a discal series of indistinct yellow-brown lunules and a submarginal series of thin yellowish lunules; postdiscal line absent or faintly indicated; no subbasal spots.

Underside: Fore wing differing from the ♂ in the same way as above; apex and outer margin paler yellowish. Hind wing as in ♂ paler.

Habitat.—Costa Rica: Cache, Rio Sucio, Juan Viñas (2,500 feet), El Alto; Panama: Chiriqui. Type in British Museum.

Dated specimens, September, October and January.

The ♂ of *P. fulvipilaga* only differs from that of *P. otares* in the presence of the yellow subapical band of fore wing, and as there are examples in which this band is greatly reduced, it may eventually prove to be a subspecies of *P. otares*, but as the ♀♀ are very different it is advisable to keep it separate until specimens are known from the intermediate districts of Honduras and Nicaragua. The male armature affords no points of difference.

59. *P. abas* Hew.

Erisia abas Hew., *Ex. Butt.* iii., *Eresia*, t. 5, f. 37, 38 (1864); *Phyc. abas* Rüb. in Seitz' *Macrolep.*, v, p. 443, t. 90, f. E6, 7 (1913).

= *P. fellula* Schaus, *Proc. U.S. Nat. Mus.*, xxiv, p. 393 (1902).

Exp. ♂ 30—38 mm.

♂. Upperside black; markings pure white. Fore wing a small round or transverse spot at end of cell, sometimes obsolete; a rather large, quadrate discal spot in 1b, a somewhat larger one in 2, placed more distad and well separated, and small, contiguous, subcostal spots in 5 and 6; no discal spot in 3, and only occasionally a minute dot in 4; a fairly large, round, postdiscal spot in 4 and two small subcostal spots or dots above it; submarginal spots absent, or only a very small linear mark in 3. Hind wing with discal band about 2 mm. wide, entire either extending to costa or terminating at vein 7; postdiscal line and submarginal lunules very slender or obsolete.

Underside: Fore wing black; base yellowish-grey as far as end of cell; white spot in cell larger than above, defined black; a small double whitish median spot in 1b; the other white spots as above, with the addition of distinct submarginal lunules in 3 and 4 and sometimes also in the other interspaces; outer margin rufous-brown, varied with whitish at apex and below vein 5. Hind wing whitish-grey; base with linear brown markings; white discal band as above; postdiscal area varied with brownish with a prominent series of black postdiscal spots ringed with whitish; submarginal lunules white, well-defined, that in 3 often extended as far as the black postdiscal spot in the same interspace forming a conical white spot.

♀ Unknown.

Habitat.—Colombia: "Bogota" (type, in Brit. Mus.), Muzo, Salinas (7,000 feet), Botero (4,000 feet), Cauca Valley (2,000 feet), Rio Daguo, Frontino, Siato (5,200 feet); Ecuador: Esmeraldas.

Dated specimens, July and August.

Although a common species, all the examples in collections appear to be males. The type specimen has the spots on the fore wing unusually small and the band of hind wing little more than half as wide as in most examples. Specimens which I took at Salinas, almost on the dividing line between the Magdalena and Cauca Valleys, seem to represent two slightly different forms, which I at first took to be the sexes. In one form the cell-spot of the fore wing above is very small or obsolete, the band of hind wing is continued to the costa and the postdiscal and submarginal lines are absent or very faint. In the other form the upperside is not so black, the cell-spot of fore wing large and transverse, the band of hind wing terminates at vein 7, the submarginal line at least is distinct, and on the underside of fore wing there is a small white linear spot at the base of cellule 2. Both forms were flying at the same time and place, and specimens from other localities, especially those from Muzo, are intermediate. Valve of the usual type, with a single process at apex. Uncus (pl. iii, fig. 20) somewhat conical, its termination with three small external processes on each side, as in *P. hermas*. Saccus with only a single, pointed projection.

60. *P. catula* Hopff.

Eresia catula Hopff., *Stett. Ent. Zeit.*, 1874, p. 356; *Phyc. catula* Rüb. in Seitz' *Macrolep.*, v, p. 445, t. 90, f. G4 (1913).

(a) *P. catula* ab. *fulvocincta* ab. nov.

- (b) *P. birivula* Dyar, *Proc. U.S. Nat. Mus.*, xlv, p. 632 (1913).
= *P. extincta* Rüb. in Seitz' *Macrolep.*, v, p. 445, t. 90, f. G5 (1913).
(c) *P. minima* Rüb. in Seitz, l.c., p. 445, t. 90, f. B2 (1913).

P. catula catula Hopff.

Exp. ♂ 30—32, ♀ 36 mm.

♂. Upperside black-brown: markings pale ochraceous. Fore wing with a fairly large spot at end of cell; a small or obsolete spot below it in 1b; a small discal spot in 1b, another, larger and much more distal, in 2, two small subcostal spots in 5 and 6, a fairly large postdiscal spot in 4 and two small subapical spots above it; at hinder angle a fragment of a thin submarginal line. Hind wing discal band narrow, very straight, entire; postdiscal line well defined, generally continued to vein 6; submarginal lunules thin but very distinct, forming a continuous waved line.

Underside: Fore wing blackish-brown; base yellow-grey, with two black lines in cell; pale yellow spots as above, sometimes whitish; outer margin rufous-brown varied with whitish; some small whitish submarginal lunules, chiefly in 1b, 3 and 4. Hind wing whitish-grey with linear brown markings on basal area; a dark brown blotch at middle of costa and another at end of cell; discal band white, broader than above, not so straight; postdiscal area varied with brown, marked with a series of small black spots, the spot in 3 displaced basad from the series; submarginal lunules white or whitish-grey, distinct.

♀. Similar to ♂ but larger.

Habitat.—Southern Peru, Uruhuasi (7,000 feet); Bolivia: Yungas de la Paz (5,200 feet), San Jacinto (6,000—8,000 feet), Callcan, Tanampayo (6,500—8,000 feet). Type, from Bolivia, in Berlin Museum.

This species, which is fairly well-figured in Seitz', does not seem to be very common. It may be known from all its close allies by the black postdiscal spot in cellule 3 of the hind wing beneath being placed distinctly nearer to the base than the spots in 2 and 4, a character which holds good in all its subspecies.

(a) *P. catula catula fulvocincta* ab. nov.

♀. Upperside: Fore wing with the usual spots, but the discal spots are placed on a broad fulvous, almost tawny area which takes the form of a band crossing the wing from costa to inner margin. Hind-wing discal band also edged with fulvous on both sides, this colour

extending distad along the veins to the postdiscal line so as to divide the intervening black area into five spots.

Habitat.—Peru-Bolivian boundary. Type in British Museum.

(b) *P. catula birivula* Dyar.

♂. Differs from *P. catula catula* in the markings above being white, the discal band of hind wing reduced to a thin line or obsolete.

Habitat.—Peru, San Miguel (6,000 feet, July); Bolivia. Type in U.S. National Museum.

I have not seen sufficient of this form to say whether it is a good subspecies. There is a single example from "Bolivia" in the Adams collection at the British Museum.

(c) *P. catula minima* Rüb.

Exp. ♂ 25—28, ♀ 34 mm.

♂. Smaller than *P. catula catula*, the fore wing a little narrower. Markings above deeper yellow; discal band of hind wing distinctly broader; postdiscal line less sharply defined, often obsolete.

Underside as in *catula catula*, except that there is generally a linear spot at the base of the cellule 2 of the fore wing, and that the white band of the hind wing is a little broader.

♀. Similar to ♂ but larger.

Habitat.—Bolivia, Bueyes; N.W. Argentina, Salta (3,500 feet), Sierra de Aconquija (2,500 feet).

Type from Salta. Very abundant in the Sierra de Aconquija in February, flying over damp spots; less abundant at Salta in March.

Male armature of *P. catula minima* differing from all species of the *P. drusilla* group in the saccus, having only a single very broad projection shaped like the tail of a fish. Valve rather narrow, with a single short process at apex and the usual long process below it. Uncus without hooks or spines. The armature of *P. catula catula* is quite similar.

61. *P. pusilla* Salv.

Eresia pusilla Salv., *Ann. Mag. Nat. Hist.* (4), iv, p. 172, N17 (1869); Druce, *Proc. Zool. Soc.*, 1876, p. 221.

= *Eresia calena* Hopff, *Stett. Ent. Zeit.*, 1874, p. 350; *Phyc. calena* Rüb. in Seitz' *Macrolep.*, v, p. 445, t. 90, f. G2 (1913).

= *Melitaea adoza* Frsch. in *Trud. Russk. Entom. Obscht.*, viii, t. 3, f. 5 (1874).

Exp. ♂ 24—28, ♀ 32 mm.

♂, ♀. Upperside blackish-brown; markings white. Fore wing with discal spots 1b and 2 contiguous, forming a single spot bisected by vein 2, the spot in 3 much more distal, round, and two small spots in 5 and 6, sometimes clouded with fuscous; a postdiscal spot in 4, placed in an oblique line with the discal spots in 2 and 3; a spot at end of cell, sometimes nearly obsolete, and two small subapical dots. Hind wing, discal band narrow, straight, entire, extending to vein 7; postdiscal line very thin or obsolete, not extending beyond vein 3 when present; submarginal line also very thin or obsolete.

Underside: Fore wing blackish-brown; base brownish-grey; white spots as above, but larger; apex and outer margin rufous-brown, with small white submarginal lunules, the posterior ones obsolete. Hind wing greyish-white, with linear brown markings on basal area; white band broader than above, but not so well defined; beyond it a brown area with a postdiscal series of small black spots; submarginal lunules white, small but distinct.

The ♀ is similar to the ♂, but slightly larger.

Habitat.—Ecuador: Archidona; Peru: Cosnipata Valley (type in Brit. Mus.), Monte Rico, San Remon (3,000 feet), La Merced (3,000 feet), Marcapata (4,000 feet), Rio Colorado (2,500 feet), Rio Perene; Bolivia: Yungas de la Paz (5,200 feet), Charaplaya, Tanampaya (6,500 to 8,000 feet).

Dated specimens, February, May, June, July, August, September and October.

This species was first figured by Erschoff, and is also well figured in Seitz. Although somewhat similar to *P. abas* and *P. catula*, the maculation of the fore wing is different, the discal spot in 2 being placed immediately above that in 1b, and an additional spot being present in 3. Examples from Peru and Bolivia, where it is common, show little variation, but in the two Ecuador specimens in the Tring Museum the white markings are a trifle larger.

Uncus slightly urn-shaped, but without hooks or spines. Saccus (pl. iii, fig. 31) with a single broad projection shaped as in *P. catula*. Valve of the normal type, the apical process very short.

62. *P. flavocincta* Dogn.

P. flavocincta Dognin, *Lep. de Loja* (1), p. 20, t. 1, f. 6 (1887).

Exp. 30—32 mm.

♂. Upperside dark brown; markings ochraceous. Fore wing with

a complete postdiscal series of round spots decreasing anteriorly, those in 1b, 4, 5 and sometimes that in 2 with blackish centres; a submarginal series of thin lunules, that in 3 much thicker than the rest. Hind wing, with discal band about 2 mm. wide, nearly straight, entire; a distinct postdiscal line, hardly broken at the veins, and a thin submarginal line formed of feebly bent lunules.

Underside: Fore wing basal area ochraceous to beyond end of cell; distal area shading to blackish-brown with ochraceous spots as above, but not so well defined, and in addition a short subcostal band of spots in 4—6, sometimes connected with the postdiscal spots by a small spot in 3; submarginal spot in 3 large and prominent, the others small or obsolescent, bordered by a brown line. Hind wing pale ochraceous, shading to brownish distally; the usual confused brown linear markings on basal area; four prominent black postdiscal spots; submarginal lunules ochraceous, fairly distinct, bordered distally by a dark brown line.

♀. Similar to ♂ but a little larger and paler.

Habitat.—Ecuador: Loja, Zamora; Northern Peru, Rio Tabaconas (6,000 feet).

Type in the Hill Museum at Witley.

A scarce and very isolated species not much like any other in pattern. Phylogenetically, however, it appears to be closely related to *P. gaujoni* Dogn.

63. *P. delphia* Feld.

Eresia delphia Feld., *Wien. Ent. Mon.*, v, p. 103 (1861); *Phyc. delphia* Rüb. in Seitz' *Macrolep.*, v, p. 440, t. 89, f. K1 (1913).

= *Eresia aceta* Hew., *Ex. Butt.*, iii, *Eresia*, t. 6, f. 39, 40 (1864); *P. delphia aceta* Rüb. in Seitz' *Macrolep.*, v, p. 440 (1913).

Exp. ♂ 30—35, ♀ 38 mm.

♂. Upperside dark brown; markings fulvous. Fore wing with a feebly indicated spot at end of cell; discal spot 1b obsolete, spots 2—6 small, of about equal size, those in 4—6 placed more obliquely; a postdiscal series of thin rings in 1b—5, followed by small whitish spots in 6 and 7; a submarginal series of thin linear spots, only slightly bent. Hind wing with faint indications of a median band; a postdiscal series of six thin but sharply-defined rings; a thin submarginal line, very slightly sinuate; towards hinder angle there is often a portion of a thread-like marginal line.

Underside: Fore wing yellow-brown, only the postdiscal area slightly

blackish; three dark lines across cell; discal spots paler than above, yellowish, not very sharply defined; postdiscal rings with dark-brown or blackish centres; a submarginal series of small whitish lunules, that in ♂ larger; a dark-brown submarginal line. Hind wing pale ochraceous; basal area with fine brown linear markings; a more or less prominent, irregular median line; a postdiscal series of small black spots; submarginal lunules a little paler than the ground-colour, rarely whitish, defined brown.

♀. Very similar to the ♂ but larger, paler, the hind wing more strongly marked beneath.

Habitat.—Colombia: Muzo, El Baldio (5,000 feet), "Bogota."

Type from Muzo, in Tring Museum.

Apparently a local species. *P. aceta* Hew. is a pure synonym, not a different form as stated in Seitz, but the latter's figure is much better than that of Hewitson. In the Tring Museum there is an aberrant ♂ in which the markings are nearly obsolete above.

Valve shaped as in *P. jana* Feld. Uncus conical, the end nearly straight, without hooks or spines. Saccus double.

64. *P. ezba* Hew.

Eresia ezba Hew., *Ex. Butt.*, iv, *Eresia*, t. 7, f. 60 (1868); Rüb in Seitz' *Macrolep.*, v, p. 440 (1913).

"Upperside: Male dark brown. Anterior wing with a spot in the cell, a band of spots at the middle, some spots near the apex, and a submarginal waved band, all rufous, except those at the apex, which are white. Posterior wing irrorated with paler colour from the base to beyond the middle; crossed near the outer margin by two bands of lunular spots.

"Underside: Anterior wing rufous, darker towards the outer margin; a spot in the cell; a band below the median nervure; a band of spots beyond the middle composed of a large triangular spot and three circular spots, the lowest spot marked with black; the apex and outer margin, which is traversed by a black line, all pale yellow. Posterior wing, pale-rufous grey from the base to the middle, with two lunular spots near the base; crossed beyond the middle by a pale yellow band, followed by four black spots and a submarginal band of lunular spots.

"Exp. $1\frac{1}{2}$ inch.

"*Habitat*.—New Granada.

"Near to *A. acesas* and also to *abas*, of which it may be only a

variety; the colour on the upperside of my specimen is much rubbed off." (Hewitson, l.c.)

I am unable to identify this species. The type has been lost, and neither the figure, which shows only the under surface nor the description, quite agrees with anything known to me, so that I am not sure that I have placed it in the right group. The figure looks more like the ♀ of *P. delphia* than anything else, but the reference to two such widely different species as *P. acesas* and *P. abas* is puzzling.

65. *P. dora* Schaus.

P. dora Schaus, *Proc. Zool. Soc. Lond.*, 1913, p. 345, t. 51, f. 9, ♀; Rüb in Seitz' *Macrolep.*, v, p. 1030 (1924).

Exp. 35—40 mm.

♀. Upperside blackish-brown; both wings with nebulous patches of yellowish scales on basal area. Fore wing with two fulvous bars at end of cell, the outer one linear, indistinct; a small yellowish median spot in 1b; a broad fulvous discal band, distally ill-defined, crossing the whole wing from inner margin to costa, marked near its proximal edge with an ill-defined yellow spot in 2 and three small subcostal spots of the same colour (sometimes diffused) in 4—6; a small yellow postdiscal spot in 1b and three others in 4—7, near costa, that in 4 the largest; a submarginal series of fulvous lunules, sometimes ill-defined. Hind wing with a narrow ill-defined fulvous median band between vein 2 and costa; a discal series of yellow lunules, more or less united along the veins with the postdiscal line so as to form rings; a submarginal series of thin yellow lunules, and sometimes a yellow marginal line.

Underside: Fore wing blackish, near base, with two yellow and two fulvous spots in cell and two or three small spots in 1b below cell; discal fulvous patch marked with three large yellow spots in 1b—3, and a short yellow subcostal band in 4—c; yellow postdiscal spots in 1b and 4, and three white subcostal dots above the latter; marginal area dark brown, with a submarginal series of yellowish lunules. Hind wing greyish-brown, darker at middle; base with linear brown markings; a whitish patch at middle of costa; an irregular dark brown median line; submarginal lunules greyish, defined dark brown.

Habitat.—Costa Rica, Poas.

A scarce and peculiar species, which seems to unite the *drusilla* group with the group of *P. delphia*. The type figured by Schaus is a ♀, and three examples in the Hill Museum at Witley, the only ones I

have seen, also seem to be of that sex. It does not appear to be a dimorphic ♀ of any other known species, as the under surface would in that case be similar. In the Witley specimens the discal markings of the hind wings are not so ring-like as they are shown in Schaus's figure, which seems a little too brightly coloured.

66. *P. Notus* Hall.

P. notus Hall, *Entomologist*, 1917, p. 163.

(a) *P. notus pullopicta* form. nov.

P. notus notus Hall (pl. ii, fig. 1, ♂).

Exp. ♂ 35, ♀ 38 mm.

♂. Upperside dark brown fore wing with a very small yellow post-discal spot in 4 and another, a mere dot, in 6; no other markings. Hind wing with three fine yellowish lines, the discal one indistinct, macular, the postdiscal one better marked, extending from inner margin to vein 6, the submarginal one composed of thin but sharply-defined lunules.

Underside: Fore wing basal half yellowish-brown, disc black, apex and outer margin brownish-ochraceous; a transverse spot outlined in dark brown at end of cell; two rather small, contiguous, yellow discal spots in 2 and 3 and two others in 5 and 6; submarginal lunules yellowish, those in 3 and 4 larger; a tawny antemarginal line. Hind wing light yellow, tinged with brownish; crossed by three fine transverse tawny lines, the first near the base, the second at middle, the third submarginal, the latter bordered proximally by indistinct pale lunules; five small black postdiscal spots.

♀. Upperside: Fore wing as in the ♂ except that there is a fulvous submarginal spot in 3 and two white subcostal dots near apex. Hind wing with small fulvous discal spots in 2--5; postdiscal and submarginal lines as in the ♂.

Underside paler than in the ♂, particularly on the hind wing, where the submarginal lunules and some spots on basal area are almost whitish.

Habitat.—Peru: Pozuzo (800 m., April), Cushi in Province Huanuco (2,000 m.); Bolivia: Cochabamba. Type in coll. Hall.

A scarce species allied to *P. gaujoni* Dogn. but very distinct; the wings are more rounded and the under surface is of a brighter and deeper colour with much more black in the disc of fore wing whilst the

hind wings are much more clearly and simply marked, with no darkening of the outer margin. The type came from Pozzuzo; there are four ♂♂ one ♀ in the British Museum from Cochabamba, a ♂ from "Peru" in the Adams collection and a ♂ from Cushi in the Tring Museum.

(a) *P. notus pullopicta* form. nov.

♂, ♀. Fore wing above with an indistinct brownish spot at end of cell, an ill-defined paler brown discal spot in 2—3, three small subcostal spots of the same colour in 4—6, two fulvous subapical dots and a submarginal series of indistinct lunules, the one in 3 bent inwards. Hind wing with the discal spots enlarged so as to form a narrow, indistinct band.

Underside as in *P. notus notus*.

Habitat.—Peru: Cushi in Province Huanuco. Type ♂, allotype ♀ and one ♂ paratype in Tring Museum. This may be only an extreme individual form, but it seems sufficiently different to deserve a name.

67. *P. catenarius* Godm. and Salv.

P. catenarius Godm. and Salv., *Trans. Ent. Soc. Lond.*, 1880, p. 131, n. 78, t. 4, f. 11, ♂.

Exp. ♂ 32 mm.

♂. Wings shaped as in *P. delphia* Feld. Upperside dark brown, slightly dusted with yellowish. Both wings with a postdiscal series of thin ochreous rings and a lunulated submarginal line of the same colour.

Underside: Fore wing blackish-brown; base ochreous as far as end of cell, with four black lines across cell; disc crossed by an ochreous band extending transversely from costa to vein 1a, broadest between 3 and costa, the band straighter than in *P. delphia*, more sharply defined; the postdiscal rings as above; submarginal lunules yellowish, bordered outwardly by a brown line. Hind wing pale ochraceous, with brown linear markings on basal area, a brown median line, small black postdiscal and whitish submarginal lunules.

Habitat.—Northern Colombia, Chinchicua Valley. Type in British Museum. Only a single ♂ known. Allied to *P. delphia* Feld. and *P. gaujoni* Dogn.; nearer to the latter but the postdiscal rings more distinct above, especially on the fore wing, and on the under surface the discal markings of fore wing are somewhat different.

68. *P. gaujoni* Dogn.

P. gaujoni Dogn., *Lep. de Loja* (1), p. 21, t. 1, f. 5 (1887).

Exp. 32—35 mm.

♂. Fore wing somewhat produced, the outer margin slightly concave below apex. Upperside dark brown, slightly dusted with yellow. Fore wing with a submarginal series of thin ochreous lunules, sometimes partly obsolete, one or two white subapical dots, and occasionally traces of small ochreous postdiscal rings in 1b and 2. Hind wing discal and postdiscal lines united so as to form thin ochreous rings, the inner edge of which is sometimes obsolete; submarginal line thin, entire, slightly lunulated.

Underside: Fore wing light olivaceous, shading to blackish in disc and to yellowish at outer margin; two dark lines in cell; ill-defined yellowish discal spots in 4—6 and small postdiscal rings in 1b, 2, 4 and 5, followed by two small white subapical spots; a submarginal series of small yellow lunules, the one in 3 larger. Hind wing olivaceous-yellow; some confused brown linear markings on basal half and an irregular brown median line; a postdiscal series of small black spots, sometimes edged whitish; submarginal lunules greyish-white, small; outer margin brown.

♀. Unknown.

Habitat.—Ecuador: Loja (type), Huigra (3,000 feet), Balsapamba. Type in Witley Museum.

I found this species fairly common at Huigra in February, but all the specimens are ♂♂. It is not unlikely that *P. gaujoni* may prove to be a subspecies of *P. catenarius* Godm. and Salv., but until more is known of the latter species I do not feel justified in uniting them.

Valve very similar to that of *P. delphia* but the apical process blunter. Uncus short, indented at end. Saccus with two rather short projections.

69. *P. sepultus* Hall (pl. ii, fig. 12, ♂).

Entomologist, vol. lxi, p. 12 (1928) (Peru).

Exp. 35—39 mm.

♂: Fore wing rather sharply truncate at apex, the outer margin strongly angled at vein 4 and excavated below it. Outer margin of hind wing strongly sinuate. Upperside of both wings dark brown; a post-discal series of thin ochraceous rings and a thin but well marked sub-marginal line of the same colour.

Underside: Fore wing coffee-brown, narrowly blackish in disc; the usual fuscous lines in the cell; an ill-defined pale spot at base of cellule 4; a discal series of five small but well defined pale ochraceous spots, those in 2 and 3 placed one above the other and contiguous, those in 4—6 forming a short, oblique subcostal band; postdiscal ochraceous rings thicker than above, enclosing brown spots a little darker than the ground colour; submarginal line dark brown, prominent. Hind wing light coffee-brown; the usual fine dark-brown lines on basal area and a rather heavy median line; blackish postdiscal dots prominent; a submarginal series of lunules of the ground-colour outlined in dark-brown, the outer definition forming a prominent waved line.

♀. Unknown.

Habitat.—Peru: Chachapoyas (M. de Mathan). Type ♂ and four ♀ paratypes in British Museum.

A very distinct although dull-coloured species. The pattern of the upperside is similar to that of *P. catenarius* Godm. and Salv. and *P. gaujoni* Dogn., but the shape of the wings and the markings of the underside are very different.

70. *P. morena* Rüb. (pl. ii, fig. 3, ♂).

P. morena Rüb. in Seitz' *Macrolep.*, v, p. 443, t. 90, f. D7 (1913).

Exp. ♂ 26—30 mm.

♂. Fore wing shorter than in *P. gaujoni*, more rounded.

Upperside dark brown. Fore wing with a thin submarginal ochraceous line, sometimes obsolete towards apex. Hind wing with thin ochraceous postdiscal rings and an undulating submarginal line.

Underside: Fore wing blackish-brown; base not paler; a pale linear mark at end of cell; a small trifold, whitish subcostal spot beyond cell, very small white postdiscal spots in 2 and 4, and two subapical dots above the latter; apex and outer margins dark rufous-brown with whitish, zigzag submarginal line. Hind wing dark brown varied with a dark ashy-grey; markings obscure, the most prominent being a dark blotch on costa and a dark brown submarginal line slightly bordered with pale atoms; the usual dark postdiscal spots present, but indistinct.

♀. Unknown.

Habitat.—Peru, Province Cuzco. Type in Berlin Museum.

A rare species.

The upperside is well figured by Seitz, but the characteristic under surface has not been previously figured.

71. *P. trimaculata* Hew.

Eresia trimaculata Hew., *Equat. Lep.*, p. 28, n. 50 (1869).

= *P. taphius* Godm. & Salv., *Ann. Mag. Nat. Hist.* (5), ii, p. 263, n. 17 (1878).

= *P. elaphiaca* subsp. *abrupta* Rüb. in Seitz' *Macrolep.*, v, p. 439, t. 89, f. 18 (1913).

Exp. ♂ 30—35 mm.

♂. Wings shaped almost as in *P. jana* Feld., but outer margin of fore wing a little more concave below middle.

Upperside dark brown. Fore wing with a rather narrow, oblique, fulvous subapical band divided into three parts, namely, three contiguous subcostal spots in 4—6, a postdiscal spot in 3 more or less completely fused with the submarginal lunule in the same interspace, and a somewhat smaller postdiscal spot in 2, sometimes followed by faint indications of another in 1b; fulvous submarginal lunules in 1b and 2, and a small white subcostal spot near apex. Hind wing with a postdiscal series of ochraceous rings and a lunulated ochraceous submarginal line.

Underside: Fore wing yellow-brown on basal half, blackish in disc, apex and outer margin rufous-brown varied with yellowish; two black lines in cell; fulvous band broader than above, the spots not separated, except the outer part of the spot in 3, which is whitish; some other small whitish submarginal lunules, two black spots below the white subcostal spot, and a brown submarginal line. Hind wing pale yellowish with linear brown markings, small black postdiscal spots and small whitish submarginal lunules.

♀. Unknown.

Habitat.—Ecuador: Rio Verde (type in Brit. Mus.), Rio Pastazza (5,000 feet), Canelos, Mirador, Balsapamba, Sarayacu. Type in Brit. Mus.

Apart from the fulvous subapical band, this species seems to be more nearly related to *P. gaujoni* than to *P. jana*. Seitz' fig. under the name of *P. abrupta* is fairly good.

Valve-shaped as in *P. jana*. Uncus and saccus also similar.

72. *P. crithona* Salv.

Melitaea crithona Salv., *Ann. Mag. Nat. Hist.* (4), vii, p. 415 (1871); *Phyc. crithona* Butl. & Druce, *Proc. Zool. Soc.*, 1874, p. 348; Godm. & Salv., *Biol. Cent.-Am. Rhop.*, i, p. 206, t. 22, f. 17, 18 (1882); Rüb. in Seitz' *Macrolep.*, v, p. 440, t. 89, f. K2—4, ♂ ♀ (1913).

Exp. ♂ 32—36, ♀ 42—44 mm.

♂. Fore wing truncate at apex; outer margin distinctly concave below apex.

Upperside dark brown. Fore wing with a transverse spot at end of cell, a small median spot in 1b and a discal spot in 2—3, all tawny, sometimes obscure or obsolete; a broad fulvous subapical band extending from middle of costa to vein 2 near outer margin, the spot in 4 generally divided into two parts by a black mark, the spot in 2 short, followed by a well separated, round postdiscal spot in 1b; sometimes a small white subcostal dot near apex. Hind wing discal and postdiscal lines ochraceous, thin, somewhat macular but not forming rings; submarginal lunules thin, forming a continuous waved line.

Underside: Fore wing blackish-brown; three large fulvous spots in cell, separated by black lines; spots in 1b and 2 fulvous; subapical band as above but paler; apex and outer margin rufous-brown with two small white subcostal spots near apex and two small silver-grey apical lunules; the other submarginal lunules obsolete. Hind wing dark rufous-brown varied with silvery-grey; the usual linear markings on basal area; a discal series of small silver-grey lunules, and larger lunules of the same colour distal to the brown postdiscal spots in 1b—3; submarginal lunules also silver-grey but thin, almost linear, those in 4 and 5 often obscured by brown shading.

♀. Similar to ♂ except that it is larger, that the last two spots of subapical band of fore wing extend diffusely to outer margin, and that the hind wings beneath are a little less brightly marked.

Habitat.—Nicaragua; Costa Rica: Cache, Juan Viñas (2,500 feet); Panama: Volcano of Chiriqui (2,000—3,000 feet), Veragua. Type in British Museum.

A rather distinct species, only agreeing in general pattern with the other members of the group. It is common in Chiriqui but rarer in Costa Rica and Nicaragua. Both sexes are excellently figured by Seitz: the ♀ is no great rarity.

Dated specimens May and October.

The male armature shows more affinity with *P. drusilla* and *P. abronia* than with *P. jana*. Valve of the normal type, with two small claw-like processes at apex.

Uncus without hooks or spines. Saccus double.

73. *P. jana* Feld.

Eresia jana Feld., *Reise Nov. Lep.*, iii, p. 394 (1867); *Phyc. jana* Rüb. in Seitz' *Macrolep.*, v, p. 439 (1913).

(a) *Eresia elaphiaea* Hew., *Ex. Butt.*, iv, *Eresia* t. 7, f. 50, 51 (1868); Druce, *Proc. Zool. Soc.*, 1876, p. 221; *Phyc. elaphiaea* Rüb. in Seitz' *Macrolep.*, v, p. 439, t. 89, f. I 7 (1913).

P. jana jana Feld.

Exp. ♂ 32—40 mm.

♂. Fore wing somewhat narrow, the outer margin straight or feebly concave below vein 4. Upperside dark brown. Fore wing with a broad band of light fulvous extending obliquely from middle of costa to vein 2 near outer margin, the band slightly or considerably narrowed at the middle, sometimes almost broken into two parts. Hind wing with slender ochraceous discal, postdiscal and submarginal lines, the two former slightly inclined to form rings.

Underside: Fore wing blackish-brown; base yellow-brown with dark lines in cell; fulvous band as above, continued indistinctly to outer margin; two small silver-grey subcostal spots near apex, with two obscure blackish spots below them; apex and outer margin dark rufous-brown, with a dark brown submarginal line bordered proximally at apex by two or three small silvery-grey lunules. Hind wing light brown varied with silvery-grey; linear brown markings on basal area and an irregular dark-brown median line; a postdiscal series of dark brown spots, ringed with silvery-grey; a submarginal series of rather small silvery-grey lunules, bordered externally by a dark-brown line.

♀. Unknown.

Habitat.—Colombia, "Bogota." Type in Tring Museum.

(a) *P. jana elaphiaea* Hew.

♂, ♀. Only differs from *P. jana jana* in the fulvous subapical band of fore wing being a little broader and less contracted at the middle.

Habitat.—Ecuador: Santa Inez (type, in Brit. Mus.); Peru: Cosnipata Valley, Marcapata (4,500 feet), Huancabamba, Caradoc, Chirimayo, Rio Colorado (2,000 feet), La Merced (2,500 feet), Pozzuzo, Chaquimayo; Bolivia: Coroico (6,500 feet), San Jacinto (6,000—8,000 feet), Bueyes, Chariplaya.

Dated specimens April, June, July, August.

The difference between the two subspecies is very slight and may not be constant.

P. jana jana seems to be a rare insect in Colombia, as I have not seen more than half-a-dozen examples, whereas *P. jana elaphiaea* is

abundant and very constant in Peru and Bolivia, but amongst more than a hundred specimens examined I have been able to detect only a single female.

Valve of *P. jana elaphiaca* (pl. iii, fig. 18) greatly narrowed anteriorly, the apex with a long and a short process set at opposite right angles, so that it somewhat resembles a boot or hammer. Uncus without hooks or spines. Saccus with two short projections.

74. *P. elaphina* Rüb.

P. elaphina Rob. in Seitz' *Macrolep.*, v, p. 439, t. 89, f. 19 (1913).
Exp. 36—38 mm.

♂. Fore wing broader than in *P. jana* Feld., the outer margin distinctly excavated below apex; cilia white between veins.

Upperside dark brown. Fore wing crossed obliquely by a broad unbroken subapical band of ochraceous-fulvous extending from middle of costa to vein 3, thence produced downward nearly to inner margin, its last two sections, in cellules 1b and 2 irregular and interrupted by a diffused brown spot. Hind wing with fulvous discal and postdiscal lines inclined to form rings; submarginal line well-defined, lunulated, entire.

Underside: Fore wing dark brown; base yellow-brown with dark lines in cell; yellow band as above; near apex two small whitish subcostal spots, followed by three black dots; a dark submarginal line and some small whitish or yellowish submarginal lunules. Hind wing brown, varied with ashy-grey or yellowish-grey; the usual brown linear markings on basal area, brown median line and postdiscal spots; submarginal lunules ashy-grey, sometimes yellowish anteriorly.

♀. Unknown.

Habitat.—Bolivia: Coroico (6,500 feet), San Jacinto (6,000—8,000 feet), Rio Tanampaya, Chariplaya.

Very similar in markings to *P. jana* but differs considerably in the shape of the wings and is evidently quite distinct. The only dated specimens available were taken in June. Seitz' figure is very good.

Valve with boot-shaped tip as in *P. jana* but furnished with unusually long hairs.

75. *P. nana* Druce.

P. nana Druce, *Trans. Ent. Soc.*, 1874, p. 156; *ibid.*, *Proc. Zool. Soc.*, 1876, p. 222; Rüb. in Seitz' *Macrolep.*, v, p. 439, t. 89, f. 16 (1913).
= *Eresia geminia* Hopff., *Stett. Ent. Zeit.*, 1874, p. 351; *Phyc.*

geminia Staud., *Ex. Schmett.*, i, p. 92 (1888); Rüb. in Seitz' *Macrolep.*, v, p. 439, t. 89, f. I 4, 5 (1913).

(a) *P. omosis* Dyar, *Proc. U.S. Nat. Mus.*, xlv, p. 632 (1913).

P. nana nana Druce.

Exp. 32—42 mm.

♂. Upperside dark brown. Fore wing with a pure white, quadrifid subapical band, the spots in 4—6 contiguous, that in 3 placed more distad but sometimes prolonged so as to become contiguous with the spot in 4; at hinder angle there is generally a fragment of an ochraceous submarginal line; sometimes a small white subcostal dot near apex. Hind wing with thin ochraceous discal and postdiscal lines tending to form rings; submarginal lunules also thin, ochraceous, forming a continuous line. Ciliae white between veins

Underside: Fore wing blackish-brown; base grey-brown with indistinct dark lines in cell; white band as above; apex and outer margin rufous-brown with two small white subcostal spots near apex, followed by two small blackish spots ringed with grey; two whitish submarginal lunules near apex and faint traces of others, bordered by a dark line. Hind wing brownish-grey varied with whitish; the usual fine brown linear markings on basal area, an irregular brown median line, small blackish-brown postdiscal spots ringed with grey, and pale grey submarginal lunules defined with brown.

♀. Unknown.

Habitat.—Peru: Cosnipata Valley (type, in Brit. Mus.), Chanchamayo, Huancabamba (600—1,000 m.), Pozzuzo (800—1,000 m.), Palcazu, Rio Colorado (2,500 feet), Uruhuasi (7,000 feet), Santana Valley; Bolivia: Yungas de la Paz.

Dated specimens March, April, May, November. A fairly common and rather variable species. The form called *geminia* Hopff. is merely individual, the white spot in 3 of fore wing being naturally contiguous with that in 4 when it is long and separated from it when it is short. I have two examples in which the band is yellowish, thus leading over to the following form.

(a) *P. nana omosis* Dyar.

Fore wing with spots 4—6 of the subapical band reduced and clouded with fuscous, partly obsolete; the spot in 3 widely separated, also reduced and clouded with brown. Underside also a little darker, the

white spots of fore wing slightly clouded with brown, the hind wing of a yellower tone.

Habitat.—Peru: Rio Pampaconas (type), La Oroya, Rio Inambari.

Type in U. S. National Museum; four ♂♂ from La Oroya in the Tring Museum dated March and August.

Male armature of *P. nana nana* very similar to that of *P. jana* and *P. elaphina*. Valve with the same boot-shaped process at apex.

76. *P. nussia* Druce.

Eresia nussia Druce, *Proc. Zool. Soc.*, 1876, p. 122; *Phyc. nussia* Rüb. in Seitz' *Macrolep.*, v, p. 439 (1913).

Exp. 36—38 mm.

♂. Upperside dark brown, dusted yellowish. Fore wing with a single white postdiscal spot in cellule 3 and above it, on the costa, a small bifid white spot; near hinder angle a fragment of a submarginal ochraceous line; occasionally small brownish postdiscal spots in 1b and 2. Hind wing with thin ochraceous discal and postdiscal lines and submarginal lunules as in *P. nana* Druce.

Underside as in *P. nana* Druce except that the white spots in 4—6 are absent, leaving that in 3 isolated.

Habitat.—Peru, Chachapoyas. Type in British Museum. Closely allied to *P. nana* Druce but apparently distinct. Rare in collections. The type specimen is without precise locality but there is a short series from Chachapoyas in the British Museum and also a specimen in the Adams collection labelled "Paraguay." The ♀ is unknown.

77. *P. leucodesma* Feld.

Eresia leucodesma Feld., *Wien. Ent. Mon.*, v, p. 103, n. 77 (1861) *ibid.*, *Reise Nov. Lep.*, iii, p. 394, t. 50, f. 11, 12 (1867); *Phyc. leucodesma* Godm. and Salv., *Biol. Cent.-Am. Rhop.*, i, p. 197 (1882); Staud., *Ex. Schmiett.*, i, p. 92, t. 36, ♂ (1888); Rüb. in Seitz' *Macrolep.*, v, p. 444, t. 90, f. F1, 2 (1913).

Eresia cincta Edw., *Proc. Ent. Soc. Phil.*, ii, p. 502 (1864).

Exp. 30—38 mm.

♂, ♀. Upperside: Fore wing black; cell dusted ochraceous; a small white spot at end of cell, sometimes obsolete; a broad white discal band 6—7 mm. wide at inner margin, extending to vein 4, where it is broadly interrupted and then continued as a narrower band to the costa; small white postdiscal spots in 4—7, that in 4 the largest; a

submarginal series of small, almost linear white spots, variable in number, those in 3 and 4 the most often present. Hind wing with very broad white band occupying at least two-thirds of the wing; base black; marginal black border 3—4 mm. wide, marked with a thin ochraceous postdiscal line, sometimes partly obsolete, and a submarginal series of very thin white lunules, also often partly obsolete.

Underside: Fore wing general pattern as above; base pale ochraceous, the white cell-spot outlined black; outer area brown with white submarginal lunules, those in 3 and 4 the largest and bordered distally by white marginal spots. Hind wing: base brownish and white; the broad white central area traversed by an irregular brown median line; marginal border brown with large black postdiscal spots (that in 3 defined with white) and white submarginal lunules.

Habitat.—Nicaragua: Chontales; Panama: Chiriqui, Calobre, Empire, Panama City, Taboga Island; Colombia: Muzo, La Mesa (4,000 feet), Crystalina, Sierra de Santa Martha, Llanos of Rio Meta, Villavicencio, Rio Dagna; Venezuela: Caracas, Puerto Cabello, Mérida, San Esteban, Cumaña; Trinidad; Tobago. Type in Tring Museum.

A well-known and unmistakable species. It is one of the most abundant butterflies in Trinidad, flying throughout the year, and is also common in Colombia and Venezuela but apparently rarer in Nicaragua. Godman and Salvin say "common through Costa Rica," but their collection contains no specimens from that country, nor have I ever seen any from there. The species shows very little variation throughout its wide range. The records from Texas and Florida under the name of *P. cincta* Edw. have not been confirmed by recent authors.

Valve of the usual shape with a single short claw-like process at apex and long thorn-like process beyond middle. Uncus fairly well developed, the end slightly expanded when seen from above. Saccus with a single long, pointed projection as in *P. ithra* and *P. dicoma*.

78. *P. ianthe* Fabr.

Pap. ianthe Fabr., *Spec. Ins.*, ii, p. 80, n. 354 (1781).

= *Pap. hera* Cram., *Pap. Ex.*, iii, p. 253, f. F, G (1782); *Phyc. hera* Rüb. in Seitz' *Macrolep.*, v, p. 443, t. 90, f. E2, 3, ♂, ♀ (1913).

Exp: 36—40 mm.

♂. Upperside black; markings pure white. Fore wing a small spot in cell; discal spots 1b—3 contiguous, forming a somewhat hammer-shaped band, spot 1b being nearly square, that in 2 twice as long as

that in 1b and that in 3 small and short; spots 4—6 also contiguous, the first-named the smallest; a fairly large postdiscal spot in 4, and three small ones above it; small submarginal spots in 3 and 4. Hind wing with median band about 3 mm. wide; postdiscal line obsolete; submarginal lunules very thin, often obscure.

Underside: Fore wing black, shading to brownish distally; base pale ochraceous; white spot in cell larger than above, defined black; discal and postdiscal markings as above; submarginal spots in 3 and 4 much larger, with white marginal spots beyond them; small submarginal lunules also in the other interspaces, partly obscured with brown. Hind wing white band broader than above; base also whitish, with linear brown markings; distal area brown, with very large black postdiscal spots, that in 3 defined with white, and large submarginal white lunules; outer margin also more or less whitish.

♀ similar to ♂ except that on the hind wing above the postdiscal line and submarginal lunules are better marked.

Habitat.—French Guiana, Cayenne; Surinam, Berg-en-daal.

A very rare species, better known under the name of *P. hera* Cram. I have a pair from Berg-en-daal taken by Michaels; there are two pairs in the Tring Museum from "Surinam interior" and a pair in the British Museum. Kirby gives "Venezuela" as a locality, but I do not know on what authority. The species is intermediate between *P. leucodesma* and *P. ofella*.

Cramer's figures are fair and quite recognizable; those of Seitz are excellent.

P. ianthe Fabr. is shown to be identical with *P. hera* Cram. by the figure of the type in Jones' unpublished "Icones."

79. *P. ofella* Hew.

Eresia ofella Hew., *Ex. Butt.*, iii, *Eresia*, t. 3, f. 18, 19 (1864); Godm. & Salv., *Biol. Cent.-Am. Rhop.*, i, p. 189 (1882); *ibid.*, l.c., ii, p. 674 (1901); *Phyc. ofella* Rüb. in Seitz' *Macrolep.*, v, p. 444, t. 90, f. F3 (1913).

= *P. ianthe* Kaye (non Fabr.), *Trans. Ent. Soc.*, 1913, p. 553.

(a) *P. ofella guaya* subsp. nov.

P. ofella ofella Hew.

Exp. 35—45 mm.

♂, ♀. Upperside black; markings pure white. Fore wing a small spot in cell; discal spots in 1b and 2 large, oblong, and, together with

the smaller spot in 3, forming an oblique band; spots in 4 and 5 smaller, placed more distad than those in 6 and on costa, which are almost linear; small postdiscal spots in 3—7, that in 3 the largest, sometimes lunular; a small submarginal spot in 4. Hind wing median band 3—4 mm. wide, of uniform breadth or slightly widened anteriorly by union with a small subcostal spot, which is rarely completely separated; occasionally faint traces of submarginal lunules.

Undersides: Fore wing blackish; base very pale yellow, sometimes with a greyish tinge; apex and outer margin brown, varied with whitish; markings nearly as above but submarginal spot in 4 larger, followed by small ones in 5—7, and there is a white marginal blotch in 3. Hind wing base white, with fine linear brown markings and a small black spot in cell; median band as above; outer area brown, varied with whitish-grey; a postdiscal series of black spots defined with white; submarginal lunules large, white, sometimes clouded with fuscous. Sexes alike.

Habitat.—Guatemala: Escuintla (1,100 feet), Mazatenango, Zapote, Volcano of Santa Maria, Polochic Valley, Forests of Northern Vera Paz; Costa Rica, Cache; Panama: Calobre, Lion Hill; Colombia: Manaure, Muzo, San Rafael (3,500 feet), Salinas, Rio Dagua, Popayan, Cananche; Venezuela: Caracas, San Esteban, Mérida; Trinidad. Type in British Museum.

Dated specimens June, July, August, September and December.

A common species which does not vary much throughout its wide range.

(a) *P. ofella guaya* subsp. nov.

♂. Discal spot 1b of fore wing shorter and semicircular, so that the spots 1b—3 form an almost circular patch instead of an oblique band. White band of hind wing slightly narrowed anteriorly.

Habitat.—Ecuador. Type and co-type in coll. Hall; one co-type in British Museum.

This form somewhat recalls *P. myia* Hew., but the white markings are much larger.

Male armature of *P. ofella ofella* showing more affinity with the group of *P. drusilla* than with that of *P. clio*, &c.

Valve of similar shape, with a very short process at apex and long thorn-like process below apex. End of uncus somewhat concave. Saccus with two slightly pointed projections.

80. *P. myia* Hew.

Eresia myia Hew., *Ex. Butt.*, iii, *Eresia*, t. 3, f. 16, 17 (1864); Godm. and Salv., *Biol. Cent.-Am. Rhop.*, i, p. 188 (1882); *ibid.*, l.c., ii, p. 674 (1901); *Phyc. myia* Rüb. in Seitz' *Macrolep.*, v, p. 444, t. 90, f. E4, 5 (1913).

(a). *P. myia griseobasalis* Rüb. in Seitz, l.c., p. 444 (1913).

P. myia myia Hew.

Exp. 30—42 mm.

♂. Upperside black; markings pure white. Fore wing without cell-spot; discal spots 1b and 2 moderately large, forming a single circular spot, spot 3 absent, spots 4—6 small, the two former placed more distad than that in b; a postdiscal series of small spots in 3—7, that in 3 the largest; a single small submarginal spot in 4, often obsolete. Hind wing with narrow median band only 2 mm. wide; a small spot on costa beyond it, often fused with the band; no postdiscal line or submarginal lunules.

Underside: Fore wing black; base bright deep yellow; outer margin brown; a transverse white spot in cell, often double, bordered with black; the other white spots as above with the addition of small submarginal spots in 4, 6 and 7 and a marginal spot in 3. Hind wing base greyish-white with linear brown markings and a small black spot in cell; white band as above; outer area dark brown with black post-discal spots defined with whitish, and greyish-white submarginal lunules much overclouded with brown.

♀. Similar to ♂ except that it is larger and that the fore wings above sometimes have a dark rufous spot in the middle of the cell.

Habitat.—Mexico: Cordoba (2,000 feet), Omealca, Atoyac, Teapa, Valladolid in Yucatan; Guatemala: Puerto Barrios, Quirigua; Honduras: San Pedro Sula; Nicaragua, Chontales. Type, from Mexico, in British Museum.

Dated specimens June, July, October, November, December.

Closely allied to *P. ofella* Hew. but the fore wings are a little broader, all the white markings smaller and the hind wing darker beneath. The two species fly together in most parts of Central America but *P. myia* extends farther northward, into Mexico, and does not range southward beyond Panama.

(a) *P. myia griseobasalis* Rüb.

♂ ♀. Smaller on an average than *P. myia myia*, the basal area of fore wing beneath grey or yellowish-grey, not bright yellow.

Habitat.—Western Mexico, Sierra Madre de Tepic; Western Guatemala: Escuintla, Mazatenango, Zapote; Salvador: Santa Tecla, Ilopango; Costa Rica: Juan Viñas (2,500 feet), Cache, Turrialba, Port Limon, Siquirres.

This slightly different form entirely replaces the typical race in Western Guatemala, Salvador and Costa Rica, but I have only seen a single example from Mexico. No locality was given for the type.

Valve of *P. myia myia* and *P. myia griseobasalis* with distinctly longer and more hook-shaped apical process than in *P. ofella*. Uncus ending in two somewhat triangular projections separated by a wedge-shaped excavation; no hooks or spines. Saccus broader.

81. *P. angusta* Hew.

Eresia angusta Hew., *Ex. Butt.*, iv, *Eresia*, t. 7, f. 58, 59 (1868); Druce, *Proc. Zool. Soc.*, 1876, p. 222; *Phyc. angusta* Rüb. in Seitz' *Macrolep.*, v, p. 445, t. 92, f. H6 (1913).

Exp. 28—34 mm.

♂. Fore wing very narrow, pointed. Upperside blackish-brown; markings pale ochraceous. Fore wing a small spot in cell, often obscure; discal spot 1b absent, spots 2 and 3 rather small, united so as to form a single round spot, spots 4—6 very small, placed more distad; small postdiscal spots, scarcely more than dots, in 4—7; submarginal spots absent or represented by dots. Hind wing with narrow median band, its anterior end separated as a costal spot; submarginal lunules very thin when present, often wholly obsolete.

Underside: Fore wing nearly as above but the base is pale ochraceous, the outer margin brown, and there is a complete submarginal series of small spots, the anterior ones whitish, and a yellow marginal spot in 3. Hind wing base pale ochraceous with linear brown markings; median band as above; outer area brown, varied with ochraceous, with small blackish postdiscal spots and yellow submarginal lunules. ♀ like ♂ but fore wing broader.

Habitat.—Colombia, "Bogota"; Ecuador: Rio Napo, Rio Pastazza; Peru: Yahuaromayo, La Merced (2,000—3000 feet), Cosnipata Valley, Huancabamba (2,000 feet); Bolivia: Santa Cruz, San Agustin Mapiri (3,500 feet), Coroico; Brazil: Chapada in Matto Grosso. Type in British Museum.

The smallest of the narrow-winged species. Although widely distributed it shows no local differences. Dated specimens January, February, March, April, May, September. Male armature similar to that of *P. ofella*.

82. *P. dicoma* Hew.

Eresia dicoma Hew., *Ex. Butt.*, iii, *Eresia*, t. 6, f. 41, 42, ♂ (1864); Reak., *Proc. Ent. Soc. Phil.*, v, p. 224 (1865); *Phyc. dicoma* Rüb., in Seitz' *Macrolep.*, v, p. 445, t. 90, f. 66, ♂ (1913).

Exp. 32—35 mm.

♂. Upperside black; markings reddish-fulvous. Fore wing, a large trifold discal patch in 1b—3, its distal end sometimes crossed by a black line so as to partly or completely separate two spots in 1b and 2; a small trifold subcostal band in 4—6, two round postdiscal spots in 4 and 5, and two small submarginal spots in 3 and 4; sometimes from one to three small spots in the cell and one or two spots at the base of cellule 1b. Hind wing with median band about 4 mm. wide extending from inner margin to costa; a submarginal series of thin lunules, often largely or wholly obsolete; rarely a short fragment of a thin postdiscal line near inner margin.

Underside: Fore wing ochraceous-fulvous; markings of upperside faintly indicated; a short, oblique, blackish band from costa to vein 4; an undulating brown submarginal line. Hind wing ochraceous, with fine linear rufous-brown markings; a postdiscal series of small fuscous spots and a submarginal series of outlined lunules.

♀. Upperside almost as in the ♂, but the markings paler, sometimes yellowish; discal patch of fore wing reduced; median band of hind wing narrower and postdiscal lines generally distinct posteriorly.

Underside a little duller than in the ♂.

Habitat.—Central and South Brazil: Theophilo Ottoni in Minas Geraes, União da Victoria (2,000 feet), Fernandez Pinheiro, Castro, Santa Catharina, Santa Maria in Rio Grande do Sul; Paraguay: Sapucay Yhu. Type in British Museum.

Dated specimens January, March, April, September, October.

This may be a mimic of *P. liriopoe claudina*, in company with which I have nearly always found it. It flies low and settles on the ground in damp places. The female is rather variable, some examples only differing from the ♂ in their slightly broader wings whilst in others the fulvous markings are much paler and reduced. The species is a local one but common where found.

Male armature more resembling that of *P. ithra* than any other species. Valvæ with a single rather long claw-like process at apex. Uncus without hooks or spines. Saccus (pl. iii, fig. 34) with a single, pointed projection.

83. *P. polinella* Hall (pl. ii, fig. 10 ♂, 11 ♀).

Entomologist, vol. lxi, p. 12 (1928) (Minas Geraes).

Exp. 32—35 mm.

♂. Wings shaped as in *P. dicoma* Hew.

Upperside blackish-brown; markings deep tawny. Fore wing with three rather ill-defined spots in the cell and three or four small, sometimes obscure spots below the cell; two roundish discal spots in cellules 1b and 2, that in 2 placed more distad so that its proximal edge is almost in line with the distal edge of that in 1b; a small bifid, subcostal spot in 5 and 6 and two contiguous postdiscal spots in 3 and 4. Hind wing with tawny median band about 4 mm. wide; no postdiscal line, but sometimes some thin submarginal lunules.

Underside: Fore wing ochraceous-fulvous with the spots of the upperside faintly indicated in paler colour, that at the apex of cell defined by dark brown lines; there is also a submarginal brown line, obsolete posteriorly, and traces of a dark line defining the inner edge of the discal spots. Hind wing pale ochraceous with fine brown striae, small fuscous postdiscal spots and feebly outlined submarginal lunules as in *P. dicoma* Hew.

♀. Wings a little more rounded than in the ♂.

Upperside: Fore wing marked as in the ♂ but the discal spots in 1b—2, the subcostal spot and the postdiscal spot in 4 are much paler, yellowish, and therefore more prominent. Hind wing with the tawny median band anteriorly about as broad as in the ♂, but between vein 4 and the inner margin becoming yellowish and narrowing to a width of less than 2 mm.

Underside almost as in the ♂, but the general ground-colour paler and the dark markings heavier.

Habitat.—Brazil, San Antonio dos Brotos, near San Fidelis, in Rio Janeiro, San Jacintho Valley, near Theophilo Ottoni in Minas Geraes. Type ♂ and two ♂ ♂ two ♀ ♀, paratypes in the British Museum; allotype ♀ and two ♀ ♀ paratypes in the Tring Museum.

A rather striking little species, nearly allied to *P. dicoma* Hew., from which the underside hardly differs, but the pattern of the upper surface

is more like that of *P. polina* Hew. or the ♂ of *P. carme* Doubl. and Hew. The Tring Museum specimens were taken in the San Jacintho Valley by S. F. Birch and one of them bears a note in his handwriting: "Frequents the virgin forest undergrowth."

84. *P. carme* Doubl. and Hew.

Eresia carme Doubl. and Hew., *Gen. Diurn Lep.*, t. 20, f. 5, ♀ (1847); Chenu, *Hist. Nat. Pap.*, p. 95, f. 201 (1874); *Phyc. carme*, Staud., *Ex. Schmett.*, i, p. 93 (1888); Rüb. in Seitz' *Macrolep.*, v, p. 446 (1913).

(a) *P. oblita* Staud., *Ex. Schmett.*, i, p. 96 (1888); Rüb. in Seitz' *Macrolep.*, v, p. 446 (1913); *Eresia oblita* Seitz, l.c., t. 92, f. D5 (1913).

P. carme carme Doubl. and Hew. (pl. i, fig. 10, ♂).

Exp. ♂, 42—45, ♀ 46—50 mm.

♂. Upperside blackish-brown. Fore wing a tawny spot in cell and sometimes another at base of cellule 2, both feebly marked; an oblong discal spot in 1b and another, more distad, in 2, both fulvous; small, indistinct, tawny subcostal spots in 4—6; a fulvous postdiscal spot in 4, and sometimes another, smaller and darker, above it.

Hind wing with transverse fulvous median band, narrowest at inner margin, where it is somewhat yellowish, widening to about 4 mm. anteriorly, terminating at subcostal vein; a deep tawny postdiscal stripe from inner margin to vein 5, where it joins the submarginal spot; submarginal spots 1—4 obsolete or represented by a fine line, those in 5 and 6 large, tawny, that at anterior angle fulvous.

Underside: Fore wing black; cell bright fulvous, crossed at about two-thirds from the base by a fine black line, the somewhat triangular spot beyond this a little paler, contiguous with the spot at the base of cellule 2; discal spots 1b and 2 pale ochraceous; subcostal spots 4—6 also pale ochraceous, forming a trifold patch; three oblong ochraceous postdiscal spots in 4—6, forming a somewhat oval patch; outer margin tawny, with two large ochraceous marginal spots in 3 and 4, and at the apex from 3 to 6 small ochraceous spots, separated into two series by a black line when more than three are present.

Hind wing pale ochraceous; two parallel black subbasal lines; median band of the ground colour bordered distally by two black lines, the more distal one thicker, which commence at inner margin and converge so as to unite at vein 5; a deep fulvous postdiscal stripe from

vein 1b to 6, bordered distally by an undulating black line defining the submarginal spots, which are large, ochraceous, those in 4—7 intersected by a black line. Thorax and abdomen whitish beneath.

♀. Upperside: Fore wing cell-spot tawny; sometimes a tawny median spot in 1b and some tawny scaling at base of cell; discal spots 1b—2 and postdiscal spots in 4 pale yellowish; subcostal spots 4—6 clear pale yellow, forming a large sharply-defined patch. Hind wing median band deep fulvous, broader than in the ♂, about 6 mm. wide anteriorly; tawny postdiscal stripe distinct.

Underside as in the ♂.

Habitat.—Venezuela (type, in Brit. Mus.), El Encanto, near Caracas (3,500—4,000 feet).

A rare and little known species, although described many years ago. A pair taken by me at El Encanto in September are the only dated specimens available. The British Museum collection contains three pairs from "Venezuela," and also examples of the larva and pupa. Both the latter have lost their original colour; the larva is armed with fairly long, pointed, non-branching spines, and the pupa bears spines almost as long as those of the larva. The insect figured in Seitz as *P. carme* ♂ does not belong here at all, but is a dark ♂ of *P. eranites* Hew.

(a) *P. carme oblita* Staud.

♂. Upperside with all markings unicolorous fulvous. Fore wing cell-spot distinct, and sometimes another small spot in cell; the other markings as in *P. carme carme*, often with a small additional submarginal spot in 4. Hind wing median band of uniform width, not narrowed posteriorly; postdiscal stripe not joining submarginal spots but continued to vein 6; all the submarginal spots distinct, the posterior ones lunular.

Underside almost as in *P. carme carme*, but on fore wing the spot at outer end of cell is pale ochraceous, more sharply separated from the fulvous basal patch, and the spot at base of cellule 2 is generally small or absent.

♀. Similar to ♂ except that it is larger and that on the fore wing above the postdiscal spot in 5 is often as large as that in 4, and there are always two submarginal spots.

Habitat.—Venezuela: San Esteban; Colombia (coll. Staudinger). Type in Berlin Museum.

Dated specimens August, September, December.

The existence of *P. carme carme* and *P. carme oblita* in the same or closely adjacent districts of Venezuela is curious; probably the former is a mountain race and the latter that of the plains. Mr. W. J. Kaye has taken an intermediate example near San Esteban and there is another intergrade in the British Museum.

85. *P. polina* Hew.

Eresia polina Hew., *Ex. Butt.* i, *Eresia*, t. 1, f. 6 (1852); *Phyc. polina* Staud., *Ex. Schmett.*, i, p. 93 (1888); Rüb. in Seitz' *Macrolep.*, v, p. 445 (1913); *Eresia polina* Seitz, l.c., t. 92, f. G5, ♂ (1913).

= *Eresia encina* Feld., *Wien. Ent. Mon.*, v, p. 103 (1861); *P. polina encina* Rüb. in Seitz' *Macrolep.*, v, p. 446 (1913).

= *P. polina intermedia* Rüb. in Seitz, l.c. (1913).

Exp. ♂ 36—50, ♀ 52—54 mm.

♂. Upperside black; markings sulphur yellow. Fore wing a round or quadrate distal spot in 1b, another, larger and more distal, in 2, a postdiscal spot in 4, and generally a small submarginal spot in the same cellule; two small, obsolete subcostal spots in 5 and 6, an obsolete spot at end of cell, and rarely a small rufous spot near base of cell. Hind wing median band 2—3 mm. wide, of uniform width or slightly broader anteriorly; a very thin or obsolete submarginal line, terminating in a well-marked spot at anterior angle.

Underside very similar in general pattern to *P. carme*. Fore wing the bright fulvous basal patch in cell separated from the pale yellow spot at end of cell by a thicker black line; the other spots of a lighter sulphur-yellow tint, the postdiscal spots in 4—6 often whitish, and the small spots at apex always silvery-white. Hind wing base whitish as far as the more distal of the two black subbasal lines; median band very pale yellow; space between the two convergent black discal lines silvery-white, the discal black line very thick and sometimes macular, fulvous postdiscal stripe continued as a line to costa; submarginal spots silvery-white anteriorly, the posterior ones pale yellow, more quadrate than in *P. carme*.

♀. Similar to ♂ except that it is larger and that on the upper surface the median band of hind wing is a little broader, more distinctly widened anteriorly, and the fulvous postdiscal stripe of underside appears as an indistinct tawny stripe.

Habitat.—Colombia: "Bogota," Muzo, La Mesa (4,000 feet), El

Baldio, Salinas (8,000 feet), Fusagasuga, Coreato; Ecuador: Quito (?), Rio Napo, Rio Pastazza; Peru: Cosnipata Valley, La Oroya, El Porvenir, Chaquimayo (2,500 feet), Rio Colorado (5,400 feet), Yahuaromayo, Marcapata (4,000 feet); Bolivia: Coroico, Yungas de la Paz, Charaplaya. Type in British Museum. Dated specimens January, February, March, April, May, July, August, September, November.

This common and widely distributed species is more closely allied to *P. carne* than it appears on the upper surface. I have examined over 300 examples from the localities given above and am quite unable to find any local differences between them; the characters which Herr Röber gives for the forms *encina* and *intermedia* are individual differences which may be found among any long series from the same district. The ♀ of *P. polina* is rare.

Uncus, viewed from above, sharply contracted at its junction with tegumen, thence gradually expanded, the end broad, with a small star-like lobe at each side. Valve of the usual shape, with a single small process at apex and large process below apex. Saccus with a single pointed projection.

86. *P. laias* Godm. and Salv.

Eresia laias Godm. and Salv., *Proc. Zool. Soc.*, 1879, p. 151, t. 14, f. 1, ♂.

(a). *P. laias lycus* Hall, *Entomologist*, vol. lxi, p. 12 (1928) (W. Colombia).

= *P. laias* Röb. in Seitz' *Macrolep.*, v, p. 446, t. 90, f. G7, 8, ♂ (1913).

P. laias laias Godm. and Salv.

Exp. ♂ 42—45 mm.

♂. Upperside black; markings fulvous. Fore wing with three large discal spots in 1b—3, forming an oblique band; two postdiscal spots in 4 and 5 and sometimes another in 6; two small submarginal spots in 3 and 4; two obsolete subcostal spots in 5 and 6 and an obsolete cell-spot. Hind wing with a rather narrow median band about 3 mm. wide anteriorly, slightly narrowed and paler posteriorly; no postdiscal stripe; a very thin submarginal line.

Underside: Fore wing blackish-brown; a very large fulvous basal patch occupying the whole of the cell and a large part of cellules 1b—3; subcostal spots 5—C pale fulvous or yellowish, well defined; postdiscal

spots 4—6 pale yellow, larger than above, forming a somewhat oval patch; outer margin deep fulvous, with a large yellow marginal spot in 4, and at apex 4—6 small white spots divided into two series by a black line. Hind wing of the same general pattern as in *P. polina* Hew.; base silvery-white, with two black subbasal lines: median band yellowish-white; two convergent black discal lines, the space between them silvery-white; a dark fulvous postdiscal stripe, continued to costa; distal area divided into submarginal and marginal spots by a black line, the submarginal spots silvery-white, the marginal spots pale yellow posteriorly and silvery-white anteriorly.

♀. Unknown.

Habitat.—Western Colombia, Frontino. Type in British Museum. Closely allied to *P. polina* Hew. and *P. carme* Doubl. and Hew, but differs somewhat in the shape of the wings as well as in markings.

(a) *P. laias lycus* Hall.

♂. Upperside differs from *P. laias laias* in the fore wings having a prominent fulvous spot at the end of the cell and rather large, well defined subcostal spots in 5 and 6, and in the hind wing having a tawny or fulvous postdiscal stripe. Underside as in *P. laias laias*.

♀. Unknown.

Habitat.—Western Colombia, Rio Aguaca Valley (5,400—6,000 feet, November). Type in coll. Hall.

Several specimens taken by Fassl in the Rio Aguaca Valley show the above differences. In the British Museum there is an exceptionally bright example from the Oberthür collection labelled "Quito," but this locality seems so doubtful that I have not ventured to make it the type.

87. *P. clio* Linn.

Pap. clio Linn., *Syst. Nat.*, i, p. 467, n. 52 (1758); *ibid.*, *Mus. Utr.*, p. 229 (1764); *ibid.*, *Syst. Nat.*, i (2), p. 757, n. 66 (1767); *Eresia clio*, *Aur. Resc. Crit.*, p. 172 (1882); *Phyc. clio* Staud., *Ex. Schmett.*, i, p. 93, t. 36, ♂ (1888); Rüb. in Seitz' *Macrolep.*, v, p. 446 (1913); *Eresia clio* Seitz, l.c., t. 92, f. H1, 2 (1913).

= *Pap. nauplia* Cram. (non Linn.), *Pap. Ex.*, iv, t. 316, f. D, E. (1782); *Eresia nauplia* Butl. and Druce, *Proc. Zool. Soc.*, 1874, p. 350.

= *Eresia clara* Bates, *Journ. Ent.*, ii, p. 192 (1864); Druce, *Proc. Zool. Soc.*, 1876, p. 222.

(a) *P. clio estebana* subsp. nov.

(b) *P. clio reducta* subsp. nov.

P. clio clio Linn.

Exp. 32—48 mm.

♂, ♀. Upperside black; markings white or cream-colour.

Fore wing with a spot at end of cell; a large discal spot in 2 and a narrower one in 3, forming together a bifid patch which rarely extends into 1b; small subcostal spots in 5 and 6, often followed by a streak on costa; a round or quadrate postdiscal spot in 4, often with a smaller one above it in 5. Hind wing transverse median band 3—4 mm. wide; a thin or obsolete submarginal line, terminating in a spot at anterior angle, both spot and line often wholly absent.

Underside: Fore wing black; base of costa fulvous; a creamy-white basal stripe in cell, its distal end sometimes separated in the form of a spot; discal and subcostal spots as above; three large white postdiscal spots in 4—6 forming an oval patch; a fulvous submarginal stripe interrupted by a white spot in 4, the latter generally confluent with the postdiscal patch; two or three small white spots at apex. Hind wing white at base; a yellowish-white subbasal band; median band a little broader than above, bordered distally by a black band from inner margin to vein 6, followed by a fulvous postdiscal band which also extends to vein 6; white submarginal spots present in 1b—4, sometimes linear, sometimes fairly broad and oblong; a white marginal patch at anterior angle and sometimes a fine white antemarginal line towards hinder angle.

The ♀ only differs from the ♂ in the fore wings being slightly broader.

Habitat.—Mexico, Teapa in Tabasco; Guatemala: Puerto Barrios, Quirigua, Polochic Valley; Honduras: San Pedro Sula, Tela; Nicaragua: Chontales, Rio Wanks; Costa Rica: Port Limon, Siquirres, Turrialba, Santa Clara Valley; Panama: Bocas del Toro, Lion Hill, Chiriqui, Veragua; Colombia: Magdalena Valley, La Mesa (4,000 feet), Rio Dagua, Rio San Juan, Rio Meta, Villavicencio; Venezuela: Merida, Orinoco Valley; British and French Guiana; Surinam; Lower and Upper Amazon generally; E. Ecuador; E. Peru; Bolivia: Torochito.

Dated specimens all months of the year.

Aurivillius has shown that the name given by Linnacus is properly applied to this species which has been designated as *P. clara* Bates by many authors.

Although *P. clio* is one of the commonest and most widely distributed species of the genus it is only with difficulty that any geographical forms

can be separated. The markings vary from pure white to cream-colour in specimens from the same localities, but for such an abundant species the variation is trifling, specimens from the most distant places as, for instance, Guatemala and Para, showing no constant differences. On the other hand, examples from certain restricted intermediate districts sometimes show certain slight peculiarities, although not as a rule sufficient to justify separation as subspecies. At La Mesa, in Central Colombia, I took specimens in which the wings are shorter and more rounded than usual and the white submarginal spots of hind wing beneath are unusually large, whilst those flying at a lower elevation in the Magdalena Valley were quite normal. Most specimens from French Guiana have pure white markings and the distal edge of the band of hind wing less sharply defined than is usually the case, but similar examples occur in Peru and other localities.

(a) *P. clio estebana* subsp. nov.

♂, ♀. Markings above pale cream-colour, broad.

Fore wing with discal spot in 2 always extended into 1b and 3; three subcostal spots in 4—6. Hind wing with median band at least 5 mm. wide, or half as wide again as the average of *P. clio clio*.

Habitat.—Venezuela, San Esteban Valley. Type ♂, allotype ♀ and eleven ♂♂ paratypes in Brit. Mus.; one ♂ paratype in coll. Hall. Appears to be a local race of very restricted distribution.

(b) *P. clio reducta* subsp. nov.

♂, ♀. A very small form with pure white markings. Fore wing cell-spot small; discal spot in 2 also reduced, not extending into 1b and sometimes not entering 3; postdiscal spot in 4 obsolete. Hind wing with white median band very narrow, scarcely 2 mm. wide.

Habitat.—Ecuador: La Chima, Chimbo, Hacienda Ave Maria, Paramba; Colombia, Juntas in the Cauca Valley.

Type ♂, allotype ♀ and five ♂♂, two ♀♀ in the British Museum; fourteen ♂♂, three ♀♀ paratypes in the Tring Museum. This is probably an altitude form rather than a true geographical race. In the Tring Museum there are also two ♂♂ from the Rio Dagua, Colombia, which are quite similar except that the markings are cream-colour.

Uncus of *P. clio clio* fairly well developed, the end broad, with a short spinose lobe at each side. Valve of the usual type, with a single short process at apex. Saccus with a fairly long projection.

(To be continued.)

A CATALOGUE OF THE LEPIDOPTERA OF HAINAN.

BY J. J. JOICEY AND G. TALBOT.

(Continued from the BULLETIN OF THE HILL MUSEUM. Vol. 11,
p. 191.)

Family ERYCINIDAE.

Subfamily NEMEOBINAE.

Forms which are recorded for the first time and those new to science and described elsewhere are marked with an asterisk.

185. *Zemeros flegyas confucius* Moore (1878).

P.Z.S., p. 701 (1878) (Hainan).

Holland, *Tr. Amer. Ent. Soc.*, xiv, p. 120 (1887) (Hainan).

Crowley, *P.Z.S.*, p. 507 (1900).

Interior, March, one ♂ ; April, two ♂ ♂ , one ♀ ; May, one ♂ ; July, one ♀ ; August, one ♂ ; September, two ♂ ♂ ; December, three ♂ ♂ , four ♀ ♀ ; no date, one ♂ , one ♀ .

186. *Dodona henrici* Holl. (1887).

D. henrici Holland, *Trans. Amer. Ent. Soc.* xiv, p. 119, pl. ii, fig. 2 (1887) (Hainan) ♀ .

We did not receive this form.

*187. *Abisara fylla fylloides* Moore (1901).

Five Finger Mountains, May, one ♂ .

This specimen is much darker than any Chinese specimen we have seen. The pale discal line on the hind wing below is placed farther from the cell than in typical *fylla* or *fylloides*. There is, however, a specimen without locality in the Joicey coll. which is hardly different from the Hainan one and may be from South China. Possibly this form represents a new race, but it cannot be founded on the single specimen.

188. *Abisara echerius saturata* Moore (1878).

Sospita saturata Moore, *P.Z.S.*, p. 701 (1878) (Hainan).

Abisara lydda Hew.; Holland, *Trans. Amer. Ent. Soc.* xiv, p. 120 (1887).

Wet form, *saturata* Moore.

Interior, April, one ♂ ; May, three ♂ ♂ ; July, one ♀ ; September, one ♂ ; no date, two ♂ ♂ . Leanui, wet month, one ♀ . Five Finger Mountains, Namfung, March, one ♂ .

Dry form, *lydda* Hew. (1866).

Interior, January, one ♀ ; March, one ♂ ; May, two ♂ ♂ ; December, 2 ♂ ♂ . Five Finger Mountains, no date, one ♂ .

The ♀ of this form is similar to the ♂ and rather different from the *saturata* ♀ .

189. *Taxila dora hainana* Riley and Godfr. (1925).

Taxila dora hainana Riley and Godfrey, *Entomol* 58, p. 140, pl. iii, fig. 4, ♂ (1925) (Hainan).

Obtained in the Five Finger Mountains, 2,000 feet, February, 1923, by Dr. Malcolm Smith.

Family LYCAENIDAE.

Subfamily GERYDINAE.

*190. *Allotinus* sp. ?

A very worn specimen, possibly a form of *subviolaceus* Feld.

191. *Gerydus boisduvali chinensis* Feld. (1862).

Miletus chinensis Feld.; Moore, *P.Z.S.*, p. 701 (1878) (Hainan). Holland, *Tr. Amer. Ent. Soc.* xiv, p. 120 (1887) (Hainan).

Interior, May, one ♀ ; September, one ♀ ; November, one ♂ , two ♀ ♀ .

Subfamily LYCAENINAE.

192. *Megisba malaya sikkima* f. *albidisca* Mre. (1884).

Megisba hamptoni Moore ; Crowley, *P.Z.S.*, p. 507 (1900) (Hainan). Interior, April, one ♂ .

193. *Lycaenopsis cardia hainana* Fruh. (1910).

Celastrina dilectus hainanus Fruhstorfer, *Stett. Ent. Zeit.*, p. 289 (1910) (Hainan).

L. cardia hainana Fruh., *Archiv f. Naturges.*, 82. Jahr, Ab. i, Heft i, p. 14 (1916).

Cyaniris dilectus Moore; Crowley, *P.Z.S.*, p. 507 (1900) (Hainan).

We cannot distinguish the Hainan specimens from the Formosa ones, and consider this a very doubtful race.

Interior, April, three ♂♂; May, one ♂. Hoihow, November, one ♀.

194. *Lycaenopsis puspa hermagoras* Fruhst. (1910).

Celastrina puspa hermagoras Fruhstorfer, *Stett. Ent. Zeit.*, p. 284 (1910) (Hainan).

Cyaniris puspa Horsf.; Crowley, *P.Z.S.*, p. 507 (1900) (Hainan).

We cannot distinguish our single Hainan example from North Indian specimens, but in the absence of larger material we must retain Fruhstorfer's name.

Interior, April, one ♂.

195. *Lycaenopsis oreas* Leech (1893).

Cyaniris oreas Leech; Crowley, *P.Z.S.*, p. 507 (1900) (Hainan).

We did not receive this species, and there is no specimen from Hainan in the British Museum.

196. *Pithecopus hylax nihana* Moore (1878).

P. nihana Moore, *P.Z.S.*, p. 702 (1878) (Hainan).

P. hylax Fbr.; Crowley, *P.Z.S.*, p. 507 (1900).

P. hylax nihana Moore; Fruhstorfer, *Archiv f. Naturges.*, 83. Jahr, Ab. A., H. 1, p. 79 (1917).

Interior, March, one ♂; April, one ♂; May, one ♂.

197. *Neopithecopus zalmora* Butl. (1869).

Crowley, *P.Z.S.*, p. 507 (1900) (Hainan).

We did not receive this species.

198. *Spalgis epius dilama* Moore (1878).

Lucia dilama Moore, *P.Z.S.*, p. 701 (1878).

Interior.—May, one ♀, much worn.

199. *Taraka hamada* Druce.

Crowley, *P.Z.S.*, p. 507 (1900) (Hainan).

We did not receive this species. There are no Hainan specimens in the British Museum.

*200. *Castalius rosimon* Fbr. (1775).

Interior, April, three ♂♂ ; May, six ♂♂ ; September, one ♂ ; December, seven ♂♂ .

201. *Castalius roxus roxana* de Nicév. (1897).

C. roxus Godt. ; Holland, *Tr. Amer. Ent. Soc.* xiv, p. 120 (1887) (Hainan).

Interior, October, one ♀ . Nodoa, August, one ♂ .

202. *Castalius elna noliteia* Fruh. (1918).

Castalius elna Hew. ; Crowley, *P.Z.S.*, p. 508 (1900) (Hainan).

We did not receive this species. There are no Hainan specimens in the British Museum.

203. *Syntarucus plinius* Fabr. (1793).

Tarucus plinius Fabr ; Crowley, *P.Z.S.*, p. 508 (1900) (Hainan).

Interior, April, two ♂♂ ; November, three ♀♀ ; December, two ♀♀ . Hoihow, December, one ♂ .

This genus is distinguished from *Tarucus* by the hairy eyes and the close approximation of veins 11 and 12.

204. *Lampides boeticus* Linn. (1767).

Moore, *P.Z.S.*, p. 702 (1878) (Hainan).

Holland, *Tr. Amer. Ent. Soc.* xiv, p. 120 (1887) (Hainan).

Crowley, *P.Z.S.*, p. 508 (1900) (Hainan).

Hoihow, January, one ♂ ; April, one ♀ ; September, one ♂ ; December, one ♂ , one ♀ . Interior, May, one ♀ .

In Seitz' *Macrolep.* ix this species is wrongly placed in the genus *Polyommatus*. The so-called *Lampides* (auct.) belong to *Jamides* in which vein 11 is connected with 12 by a bar.

205. *Lycaenesthes lycaenina lycaenina* Feld. (1868).

L. lycaenina Feld. ; Crowley, *P.Z.S.*, p. 507 (1900) (Hainan).

L. lycaenina lycambes Hew. ; Fruhstorfer, *Zool. Mededeel.* ii, Af. 2, p. 101 (1916) (Sikkim, Naga Hills, Siam, Hainan).

Fruhstorfer, l.c., retains *lycaenina* for the Ceylon form but does not say how it differs from the mainland one. We therefore follow Swinhoe in *Lep. Indica*, in treating *lycambes* Hew. as a synonym. The South India *orissica* Moore (1884) is no different unless specimens of the dry season can be distinguished.

Interior, April, one ♀ ; July, one ♂ .

*206. *Una usta* Dist. (1886).

Interior, April, one ♂ .

*207. *Jamides bochus formosanus* Fruh. (1916).

Interior, October, one ♂ . Five Finger Mountains, Namfung, March, one ♀ .

This race is but slightly differentiated from the Indian *bochus* Cr.

208. *Jamides celeno* Cram. (1775).

L. aelianus Fabr. ; Holland, *Tr. Amer. Ent. Soc.* xiv, p. 120 (1887).

L. celeno Cram. ; Crowley, *P.Z.S.*, p. 508 (1900) (Hainan).

Form vern. *celeno* Cram.

Interior, March, one ♂ ; April, one ♀ ; May, one ♂ ; June, two ♂ ♂ ; August, one ♂ ; November, one ♂ ; December, one ♂ . Hoihow, October, one ♀ .

Form aestiv. *alexis* Stoll. (1790).

Interior, April, one ♂ , one ♀ ; May, one ♀ . Hoihow, January, one ♂ , 2 ♀ ♀ .

209. *Jamides elpis* Godt. *euryssaces* Fruh. (1916).

L. elpis Godt. ; Crowley, *P.Z.S.*, p. 508 (1900) (Hainan).

L. elpis euryssaces Fruhstorfer, *Archiv f. Naturges.*, 81. Jahr, Ab. A, Heft 6, p. 17 (1916) (Assam, Sikkim, Tenasserim).

Interior, April, six ♂ ♂ , two ♀ ♀ ; May, three ♂ ♂ , one ♀ ; June, one ♂ ; July, one ♂ ; August, one ♂ ; September, one ♀ ; November, one ♂ ; April—December, one ♂ . Hoihow, July, one ♂ ; February—December, one ♂ . Five Finger Mountains, 4,000 feet, June, one ♀ ; June, one ♂ .

(We do not agree with the conception of *Polyommatus* and *Lampides* in Seitz' *Macrolep.* ix).

*210. *Nacaduba pavana nabo* Fruh. (1916).

Zool. Mededeel., Deel ii, Afl. 2, p. 108 (1916) (Assam, Sikkim, Bhutan, S. India, Andamans?).

Interior, April, one ♂.

*211. *Nacaduba pactolus continentalis* Fruh. (1916).

Zool. Mededeel., Deel ii, Afl. 2, p. 114 (1916) (Sikkim, Bhutan, Assam, Birma).

Interior, April, one ♂; May, two ♀♀.

This agrees exactly with Indian specimens except being a little larger. We have not compared with Formosa examples but in these the ♀ has rather broad dark margins. Neither Bethune-Baker, who described the Formosa form under the name of *hainani*, nor Fruhstorfer, l.c., gives any details by which this form is distinguished from its near Indian ally. Fruhstorfer has figured the genitalia, but as no figure is given or remark made of the genitalia of the Indian form, we conclude that no difference was found.

212. *Nacaduba nora ardates* Moore (1874).

N. nora ardates Moore; Fruhstorfer, *Zool. Mededeel.*, ii, Afl. 2, p. 117 (1916).

N. ardates Moore; Crowley, *P.Z.S.*, p. 507 (1900) (Hainan).

Interior, April, one ♂; May, one ♂.

The so-called race *formosana* Fruhst. (1916) does not appear to have any standing.

213. *Nacaduba aluta coelestis* Nicév. (1886).

Crowley, *P.Z.S.*, p. 507 (1900) (Hainan).

We did not receive this species, but two specimens from the Crowley collection (coll. Whitehead) are in the British Museum.

*214. *Nacaduba berenice plumbeomicans* W.-M. and de Nicév. (1880).

Interior, April, four ♂♂, one ♀; May, one ♂.

215. *Nacaduba atrata gythion* Fruh. (1916).

N. Kurava Moore; Crowley, *P.Z.S.*, p. 507 (1900) (Hainan).

Interior, May, one ♂, four ♀♀; June, one ♂. Five Finger Mountains, April, one ♂.

216. *Catochrysops strabo* Fbr. (1793).

Lampides kandarpa Horsf. ; Moore, *P.Z.S.*, p. 702 (1878) (Hainan).

C. strabo Fabr. ; Crowley, *P.Z.S.*, p. 508 (1900) (Hainan).

Hoihow, April, one ♀ ; October, two ♂ ♂ . Interior, April, one ♂ , one ♀ ; October, two ♂ ♂ ; November, one ♂ ; December, three ♂ ♂ .
f. *lithargyria* Moore (1877).

Interior, March, one ♂ ; April, two ♂ ♂ ; May, four ♂ ♂ ; August, two ♂ ♂ ; September, one ♂ ; October, one ♂ ; November, one ♂ ; December, one ♂ . Hoihow, one ♀ without date.

*217. *Euchrysops cnejus* Fbr. (1798).

Hoihow, October, two ♀ ♀ . Interior, May, one ♂ ; August one ♀ ; September, two ♂ ♂ , one ♀ ; December, one ♂ , one ♀ .

We retain the name *Euchrysops* which was restored by Mr. Bethune-Baker in 1922. In this genus the species have glabrous eyes, but in *Catochrysops* the eyes are densely hairy.

*218. *Euchrysops pandava* Horsf. (1829).

Interior, April, one ♂ ; May, seven ♂ ♂ ; August, one ♀ ; November, one ♂ ; December, two ♂ ♂ , four ♀ ♀ .

219. *Everes argiades parrhasius* Fbr. (1793).

Everes dipora Moore ; Crowley, *P.Z.S.*, p. 507 (1900) (Hainan).

Interior, April, three ♂ ♂ , one ♀ ; May, two ♂ ♂ ; September, one ♀ ; October, one ♀ ; December, six ♂ ♂ . Five Finger Mountains, April, four ♂ ♂ .

220. *Zizeeria maha* Koll. (1848).

? *Polyommatus similis* Moore, *P.Z.S.*, p. 702 (1878) (Hainan).

Lycaena similis Mre., Holland, *Tr. Amer. Ent. Soc.* xiv, p. 120 (1887) (Hainan).

Interior, March, two ♂ ♂ ; June, four ♂ ♂ ; September, one ♂ , one ♀ ; October, one ♂ ; November, one ♂ ; December, one ♂ . Hoihow, April, one ♀ ; October, one ♀ ; November, one ♂ .

We retain the genera adopted by Dr. Chapman in his revision of this group in 1910.

*221. *Zizina otis* Fabr. (1787).

Interior, November, two ♂ ♂ ; December, one ♂, two ♀ ♀ .
Hoihow, January, one ♂ ; October, two ♂ ♂, one ♀ ; November,
one ♂, one ♀ .

*222. *Zizula gaika* Trim. (1862).

Hoihow, January, one ♂ .

223. *Chilades laius* Cram. (1780).

Polyommatus varunana Moore, *P.Z.S.*, p. 702 (1878) (Hainan).

P. laius Moore, l.c. p. 702.

f. *ladius* = Dry form.

Interior : December, one ♀ . Hoihow, November, two ♂ ♂ ;
December, four ♂ ♂, three ♀ ♀ . The ♀ is blue.

f. *varunana* = Wet form.

Hoihow, May, one ♂ ; June, one ♀ ; October, two ♂ ♂, three
♀ ♀ ; November, one ♂ . The ♀ is brown.

224. *Heliophorus epicles phoenicoparyphus* Holl. (1887).

Ilerda belena Hübner ; Moore, *P.Z.S.*, p. 702 (1878) (Hainan).

Thecla phoenicoparyphus Holland, *Tr. Amer. Ent. Soc.*, xiv, p. 120,
pl. ii, fig. 1 (1887) (Hainan).

Ilerda epicles Godt. ; Crowley, *P.Z.S.*, p. 508 (1900) (Hainan).

Heliophorus epicles phoenicoparyphus Holl. ; Riley, *Journ. Bomb.
N.H. Soc.*, xxxiii, p. 388 (1929) (Hainan, South China.)

Interior, March, five ♂ ♂ ; April, three ♂ ♂, one ♀ ; May, four
♂ ♂, two ♀ ♀ ; July, one ♂ ; September, one ♂ ; October, one ♂ ;
December, three ♂ ♂, two ♀ ♀ . Hoihow, December, one ♂ . Five
Finger Mountains, March, one ♀ .

225. *Curetis sperthis* Feld. (1865).

Crowley, *P.Z.S.*, p. 508 (1900) (Hainan).

We did not receive this species.

In Seitz' *Macrolep.* ix this species does not receive any notice and is
presumably merged with *insularis* Horsf. Dr. Seitz seems to have
ignored the revision made by Dr. Chapman in 1915 which we consider
as being far more reliable than the classification adopted by Seitz.

226. *Curetis bulis* D. and H. (1852).

Crowley, *P.Z.S.*, p. 508 (1900) (Hainan).

We did not receive this species.

*227. *Curetis acuta dentata* Moore (1879).

Interior, April, three ♂♂ ; May, five ♂♂, two ♀♀ ; June, one ♂ ; July, one ♂ ; August, one ♂. Five Finger Mountains, May, one ♂.

f. *angulata* Moore (1883).

Hoihow, January, one ♀.

It seems probable that *dentata* is the wet form and *angulata* the dry one.

*228. *Curetis paracuta* de Nicév. (1902).

Interior: April, one ♂ ; May, two ♂♂.

As *paracuta* as well as *acuta* occur on the island, we must consider these as distinct species. Dr. Chapman (*Nov. Zool.*, xxii, 1915, p. 98) sees "No objection to anyone regarding these as good species," though he prepared to treat them as races.

A specimen from Hainan is in the British Museum from the Crowley collection.

This species is omitted from Seitz' *Macrolep.*

*229. *Spindasis syama peguanus* Moore (1884).

Interior May, one ♂ ; December, one ♂.

In Seitz' *Macrolep.*, ix, p. 937, this insect is wrongly placed under *lohita*.

230. *Spindasis lohita himalayana* Moore (1884).

Aphnaeus lohita Horsf. ; Moore, *P.Z.S.*, p. 702 (1887) (Hainan).

Interior, April, one ♂, three ♀♀ ; May, two ♂♂, three ♀♀ ; July, one ♀ ; August, two ♂♂ ; December, two ♂♂, one ♀ ; September, one ♀. Leanui, wet month, one ♀.

These specimens have a tendency to blackish markings on the underside and so approaching the form found in Formosa.

Subfamily THECLINAE.

*231. *Surendra quercetorum* Moore (1857).

Interior: May, one ♀.

232. *Horsfieldia anita hainana* Crwly. (1900).

P.Z.S., p. 508 (1900) (Hainan).

Horsfieldia anita hainana Crowley; Riley, *Entomol.*, 55, p. 25 (1922).

Interior, May, one ♂ ; no date, one ♂ .

233. *Mahathala hainana* B.-Bkr. (1903).

Trans. Zool. Soc. Lond., 17, p. 23, pl. i, fig. 1, ♀ (1903) (Hainan).

M. ameria Moore, *P.Z.S.*, p. 702 (1878) (Hainan).

Hoihow, August, one ♀ . Nodoa, August, three ♀ ♀ .

*234. *Amblypodia centaurus* Fbr. (1775).

Interior, April, one ♂ ; July, one ♂ ; August, one ♂ .

*235. *Amblypodia eumolphus* Cram. (1780).

Interior, April, one ♂ , one ♀ ; May, seven ♂ ♂ , six ♀ ♀ ; June, six ♂ ♂ , two ♀ ♀ ; July, one ♂ , one ♀ ; August, two ♂ ♂ , six ♀ ♀ ; September, one ♂ , one ♀ ; no date, three ♀ ♀ .

*236. *Amblypodia oenea* Hew. (1869).

Interior, May, two ♀ ♀ ; August, one ♀ ; October, one ♂ .

*237. *Amblypodia atrax* Hew. (1862).

Interior: April, one ♂ , one ♀ .

This species is known from Burma.

Mr. Riley informs me that the type of *atrax* is lost, but our specimens agree with Mr. Riley's idea of that species. The figure in Seitz' *Macrolep.* ix, pl. 150g, does not agree, as our specimens are darker below with the bands of spots more distinctly separate. Unfortunately in this work no statement is given as to the locality of the specimens figured, nor whether they are copied from figures of the type.

*238. *Amblypodia ariel* Doh. (1891).

October, one ♂ ; July, one ♂ ; September, one ♀ .

These specimens agree with Assam ones. The species is represented by a race in Formosa.

239. *Tajuria malcolmi* Riley and Godfr. (1925).

Tajuria cippus malcolmi Riley and Godfr., *Entomol.*, 58, p. 142, pl. iii, fig. 3 (1925) (Hainan) ♀.

Obtained in the Five Finger Mountains, Lia Mui, 4,000 feet, February, 1923, by Dr. Malcolm Smith.

As we have received *cippus maxentius* Fruh., we treat *malcolmi* as a species.

240. *Tajuria cippus maxentius* Fruhst.

Berl. Ent. Zeit., 65, p. 211 (1912) (Malay Peninsula).

Hoihow, October, one ♂, one ♀; August, one ♀.

This form occurs also in Burma.

*241 *Remelana jangala hainanensis* J. and T.

Tajuria travana hainanensis Joic. and Talb., *Bull. Hill Mus.* i, p. 353 (1922) (Hainan).

Remelana jangala hainanensis J. and T.; Seitz' *Macrolep.* ix, p. 977 (1926).

The following is corrected from the original publication:—

Hoihow, August, one ♂, one ♀ (Types); September, one ♀; October, two ♂♂, one ♀; November, one ♀; December, two ♂♂. Interior, November, one ♀. Leanui, wet month, two ♂♂, one ♀.

*242. *Sinthusa chandrana* Moore (1882).

Interior, April, one ♀.

*243. *Catapoecilma elegans major* Druce (1895).

P.Z.S., p. 612 (1895) (N. India).

C. major major Druce; Fruhstorfer, *Zeit. wiss. Insekt. biol.*, pp. 220-221 (1915) (Sikkim).

Interior, April one ♂; May, one ♀.

*244. *Zeltus etolus* Fbr. (1787).

Interior: July, one ♀; August, one ♂, one ♀; September, four ♂♂. Five Finger Mountains, May, one ♂. Hoplohr District, April, one ♂.

*245. *Ticherra acte* Moore (1857).

Interior, July, one ♂.

246. *Yasoda tripunctata* Hew. (1863).

Yasoda pita Horsf. ; Crowley, *P.Z.S.*, p. 508 (1900) (Hainan).

We did not receive this species. Mr. Riley informs us that Crowley's specimen in the British Museum is a ♂ of *tripunctata*.

247. *Loxura atymnus* Cram. (1780).

Crowley, *P.Z.S.*, p. 508 (1900) (Hainan).

Interior, March, one ♂, three ♀ ♀ ; April, one ♂ ; May, one ♂ ; July, one ♂ ; September, five ♂ ♂, two ♀ ♀ ; October, one ♂, one ♀ ; December, two ♂ ♂. Nodoa, August, two ♂ ♂. Leanui, wet month, one ♀.

*248. *Deudorix epijarbas* Moore (1857).

Interior, September, two ♂ ♂.

*249. *Deudorix eryx* Linn. (1771).

Interior, June, one ♀ ; July, one ♂.

*250. *Rapala jarbas* Fbr. (1787).

Interior, May, one ♀.

*251. *Rapala xenophon* Fbr. (1793).

Interior, September, one ♂.

252. *Rapala schistacea* Moore (1881).

Rapala manea Hew. ; Crowley, *P.Z.S.*, p. 508 (1900) (Hainan).

We have no evidence that *manea* Hew. occurs anywhere but in Celebes. We have not seen Hainan specimens of *schistacea*, but this form exists in the British Museum from Hongkong. It also occurs in the Philippines, and some specimens may be easily confounded with *manea*.

(To be continued.)

NEW AFRICAN LEPIDOPTERA HETEROCERA.

By W. H. T. TAMS.

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(Plate VIII.)

THE material which forms the basis of these descriptions was collected by Mr. T. A. Barns on his various expeditions in the Congo and Angola, and was generously presented to the British Museum by Mr. J. J. Joicey, together with a large number of other moths.

NOTODONTIDAE.

Antheua psolometopa sp. n. (pl. viii, fig. 12 ♀).

♀. Palpus chaetura black, with long hair-scales finely tipped with cartridge-buff. Antenna olive-grey, pectinations honey-yellow. Thorax chaetura black to dark olive-grey, with long hair-scales finely tipped with cartridge-buff. Abdomen (tergum) ochraceous orange. Pectus and legs chaetura drab to dark olive-grey, with long hair-scales finely tipped with cartridge-buff. Venter chaetura drab. Fore wing chaetura black, fringe dark olive-grey; antemedial and postmedial fasciae, reniform stigma and a pre-terminal series of interneural spots merely indicated by a slight enrichment of the black ground colour. Hind wing cartridge-buff lightly suffused with drab; a distinct discocellular streak; fringe dark olive-grey. Underside: Fore wing cartridge-buff lightly suffused with olive-grey, costa and fringe dark olive-grey; hind wing similar to upperside, with dark olive-grey along costa, but without discocellular streak. Expanse: 44 mm.

Holotype ♀ : Angola, South Bihé District, Benguela Plateau (5,000 feet), November, 1928 (T. A. Barns).

Paratypes: 7 ♀ ♀ with the same data.

METARBELIDAE.

Metarbela sphacobapta sp. n. (pl. viii, fig. 5 ♂).

♂. Palpus pale olive-buff mixed with citrine drab. Antenna with shaft pale olive-buff, pectinations clove brown irrorated with pale olive-buff. Head, thorax, abdomen (tergum), pectus, legs and venter pale olive-buff mixed with light greyish olive to citrine drab or deep olive. Fore wing pale olive-buff mixed with olive-buff; a light buff streak along distal half of anal vein; a narrow citrine drab subterminal fascia oblique from costa to about middle of vein M1 (somewhat nearer termen), thence bowed (concavity basad) to tornus; fringe light buff at base, light greyish olive mixed with cartridge-buff distally. Hind wing light buff lightly suffused with light greyish olive; fringe light buff proximally, to cartridge-buff distally. Underside of both wings light buff lightly suffused with light greyish olive; fringes as on upper side. Expanse: 29—35 mm.

Holotype ♂: South Central Angola, Upper Cubango-Cunene Watershed (5,500 feet), November, 1928 (T. A. Barns).

Paratype ♂ from the same source, dated October, 1928.

LASIOCAMPIDAE.

Pseudometa leonina sp. n. (pl. viii, fig. 6 ♂).

♂. Palpus vinaceous russet. Antenna tawny. Head tawny tinged with vinaceous russet in front. Thorax tawny. Abdomen (tergum) warm buff. Pectus and legs vinaceous russet, the legs streaked and irrorated with warm buff. Fore wing tawny; a faint, slender, slightly bowed (concavity basad) vinaceous russet antemedial fascia; a small fuscous black spot on discocellulars; a faint, slender, vinaceous russet postmedial fascia from costa (at right angles) to junction of veins R5 and M1, thence practically straight to tornus; traces of a broad fascia of warm buff irroration subterminally, faintly outlined proximally and distally with diffuse vinaceous russet, the outer edge forming a bow (concavity terminad), approximately between the ends of veins R5 and Cu2; fringe vinaceous russet. Hind wing warm buff tinged with tawny from base to anal angle; fringe vinaceous russet, Indian red at anal angle. Underside fore wing tawny, with a faint fuscous shade subterminally from just before apex spreading diffusely towards upper angle of cell; underside hind wing warm buff, with fuscous along costa, which

is fringed with vinaceous russet; fringe vinaceous russet, Indian red at anal angle. Expanse: 32 mm.

Holotype ♂: Belgian Congo, West Kivu, Upper Lova Valley near Masisi, 5,000—6,000 feet; forest and long grass; wet season, February, 1924 (T. A. Barns).

Pseudolyra bubalitica sp. n. (pl. viii, fig. 10 ♀).

♀. Palpus with cinnamon scales mixed with long, rich clove-brown to blackish brown hair-scales tipped with cinnamon. Antenna cinnamon. Head with frons warm buff, cinnamon-brown laterally; vertex rich clove-brown to blackish brown. Thorax rich clove-brown to blackish brown. Abdomen (tergum) pinkish buff to cinnamon-buff. Pectus rich clove brown mixed with cinnamon in front, pinkish buff behind. Legs cinnamon-buff, tibiae and tarsi strongly suffused with rich clove-brown with cinnamon irroration. Venter rich clove-brown streaked with cinnamon, anal tuft cinnamon. Fore wing clove-brown enriched at base, along inner margin and beyond subterminal fascia with blackish brown; a longitudinal blackish brown fascia through middle of cell; an obscure blackish brown postmedial fascia roughly parallel with termen, and a similar but more conspicuous subterminal fascia interrupted by the chestnut-brown veins; fringe blackish brown, finely edged with pinkish buff. Hind wing pinkish buff, the veins tinged with walnut-brown, the costa with clove-brown; termen and fringe walnut-brown, the latter finely edged with pinkish buff. Underside: Fore wing wood-brown, with some pinkish buff irroration, the veins and termen cinnamon brown; fringe fuscous, finely edged with pinkish buff; hind wing pinkish buff, costa broadly rich clove-brown to blackish brown, veins cinnamon-brown; some fuscous irroration before termen; fringe hair brown finely edged with pinkish buff. Expanse: 52 mm.

♂. Similar. Expanse: 37 mm.

Holotype ♀ and allotype ♂: S.E. Angola, Moxico District (Zambesi-Congo Divide) (4,000 feet), October, 1928 (T. A. Barns).

Leipoxais tolmera sp. n. (pl. viii, fig. 11 ♂).

♂. Palpus, antennal shaft, head and thorax tawny to vinaceous russet irrorated with light buff; antennal pectinations honey-yellow to bone-brown. Abdomen (tergum) light buff, vinaceous russet at base. Pectus and legs light buff suffused with tawny to vinaceous russet. Venter vinaceous russet. Fore wing light buff, lightly streaked with

vinaceous russet to walnut-brown; an outwardly slightly oblique, slightly bowed (concavity terminad) walnut-brown and bone-brown antemedial fascia, preceded by a fascia of ground colour without streaks, preceded in turn by a faint walnut-brown fascia parallel with the antemedial; a walnut-brown and bone-brown postmedial fascia, slightly bowed (concavity terminad), succeeded by a fascia of unadulterated ground colour and a diffuse parallel walnut-brown shade; sparse fuscous black irroration subterminally near costa; fringe walnut-brown. Hind wing light buff, tinged with tawny from base towards anal angle, suffused with vinaceous russet before termen, with a tinge of walnut-brown at apex; a very faint bowed (concavity terminad) vinaceous russet postmedial fascia actually across the middle of the wing; fringe vinaceous russet. Underside: Fore wing light buff, costa tawny; postmedial fascia similar to that on upperside but less sharply defined; subterminally three or four fuscous black interneural spots just before apex; fringe walnut-brown; hind wing underside light buff sparsely irrorated with vinaceous russet and walnut-brown; costa walnut-brown; a well-marked walnut-brown postmedial fascia, almost straight, outwardly dentate on the veins, succeeded by a fascia of ground colour and then a diffuse walnut-brown shade; sparse fuscous black subterminal irroration parallel with termen, with even more sparse fuscous black irroration between it and termen; none of the fasciae reach inner margin; fringe vinaceous russet. Expanse: 40 mm.

Holotype ♂: Belgian Congo, Ruanda District, Lake Kivu, Rugege Forest (8,000 feet), December, 1921 (T. A. Barns).

LIMACODIDÆ.

Scotinochroa mesepirotica sp. n. (pl. viii, fig. 1 ♂).

♂. Palpus Brussels brown with some orange-buff to light orange-yellow above. Antennal shaft light buff finely and lightly barred with warm sepia. Head, thorax and abdomen (tergum) dark vinaceous brown, the thorax with some Brussels brown intermixed and some underlying warm buff, the abdomen with some warm buff intermixed laterally, crests with warm buff intermixed. Pectus and legs Brussels brown to dark vinaceous brown, the tibiae tipped with warm buff, the tarsi ringed with warm buff and fuscous black, with some long fuscous hair-scales on mid and hind legs. Venter dark vinaceous brown. Fore wing dark vinaceous drab mixed with deep slaty brown; an obscure velvety blackish brown postmedial fascia from costa at four-fifths, commencing

as an irregular dash from costa at right angles, a gap, a longitudinal dash below vein R5 at its junction with the stalk of R3 + R4, another gap, then running along discocellulars and sharply oblique and zig-zag to inner margin at one-fourth; an obscure velvety blackish brown crenulate subterminal fascia, bowed (concavity basad) from costa to vein Cu2, then waved to inner margin; the postmedial succeeded and the subterminal preceded by olive-buff; a large oval patch of olive-buff from vein M3 to tornus, its proximal edge touching the subterminal fascia; fringe dark vinaceous drab with warm buff along its base. Hind wing light buff, with inner margin warm buff tinged with drab; fringe as in fore wing. Underside: Fore wing light buff, inner margin broadly cartridge-buff; costa cinnamon; cell and beyond it to near apex shaded with dark vinaceous drab to fuscous; hind wing light to warm buff; costa shaded with dark vinaceous drab. Expanse: 32 mm.

Holotype ♂ and paratype ♂: Belgian Congo, Luvua River (East bank) (3,000 feet), 85 miles N. of Lake Mweru, end of wet season, April, 1922 (T. A. Barns).

Scotinochroa charopocelis sp. n. (pl. viii, fig. 2 ♂).

♂. Palpus Brussels brown. Antennal shaft light buff, pectinations honey-yellow, anterior row infusate. Head, thorax and abdomen (tergum) warm sepia, abdomen with some light buff and fawn colour laterally and with the crests light buff at their bases, then Brussels brown, the tips warm sepia. Pectus and legs fawn colour shaded with warm sepia, tarsi ringed with warm buff. Venter warm sepia, anal tuft warm buff. Fore wing fuscous, costa edged with Brussels brown; a velvety blackish brown postmedial fascia from costa at four-fifths, commencing as an irregular dash from costa at right angles, a gap, a longitudinal dash below vein R5 at its junction with the stalk of R3 + R4, another gap, then running along discocellulars and sharply oblique and zig-zag to inner margin at one-fourth, some fawn colour to Brussels brown scaling before it in the antemedial region; a velvety blackish brown crenulate subterminal fascia, bowed (concavity basad) from costa to vein Cu2, curling round and bowed (concavity terminad) to just before tornus; some scattered glossy pale olive-buff irroration between postmedial and subterminal fasciae, more pronounced at costa, the subterminal fascia from costa to vein M3 edged distally with pale olive-buff; at tornus a prominent oval spot of fawn colour, 3 mm. long and half as wide; fringe fuscous with a warm buff line along its base. Hind wing light buff, edged costally with warm sepia, termen edged

with fuscous; fringe warm buff along its base, fuscous through its middle, the edge cartridge buff tinged irregularly with fawn colour, except at anal angle, where the fringe is edged with warm sepia. Underside: Fore wing light buff, cartridge-buff below cell to inner margin, costa and subcostal vein Brussels brown, upper edge of cell fawn colour, with some Brussels brown shading on veins R2, R3 and R4; cell and area beyond it, but not quite to apex, fuscous; termen broadly blackish brown interrupted at veins; fringe fuscous, with a warm buff line along its base; hind wing light buff, costa edged with sepia; termen edged with blackish brown, interrupted at veins, the edging decreasing and becoming obsolete at tornus; fringe as on upper side. Expanse: 30 mm.

Holotype ♂: Tanganyika Territory, District of the Great Craters, February—March, 1921 (T. A. Barns).

Paratype ♂: Tanganyika Territory, Aruscha District, Lake Eyasi (North End) (3,500—4,000 feet), dry stony country, March, 1921 (T. A. Barns).

Latoia joiceyi sp. n. (pl. viii, fig. 15 ♀).

♀ Palpus pale orange-yellow. Antenna drab. Head pale orange-yellow. Thorax drab to buffy brown. Abdomen (tergum) ochraceous orange, anal tuft cinnamon-buff. Pectus light buff, drab in front. Legs light buff tinged with ochraceous buff. Venter light to warm buff. Fore wing drab to buffy brown, glossy, costa at apex finely edged with fuscous black; faint traces of an oblique postmedial fascia from costa at two-thirds, slightly waved and ending in a conspicuous glossy white wedge-shaped (point costad) streak from vein Cu2 to inner margin. Hind wing uniform drab to buffy-brown. Underside similar, drab, the postmedial streak on inner margin warm buff instead of white. Expanse: 28 mm.

Holotype ♀: Belgian Congo, Ruanda District, Lake Kivu (8,000 feet), December, 1921 (T. A. Barns).

Thosea oria sp. n. (pl. viii, fig. 14 ♂).

♂. Palpus bay. Antennal shaft warm buff streaked with bay, pectinations honey yellow. Head and patagium buff streaked with bay, rest of thorax bay irrorated with warm buff. Abdomen (tergum) bay. Pectus bay irrorated with warm buff. Legs bay, with long hair-scales tipped with warm buff; fore leg with tibia and each tarsal segment tipped with cartridge-buff; mid and hind legs with tibia and each tarsal

segment tipped with warm buff. Venter bay irrorated with warm buff. Fore wing bone brown irrorated with blackish brown; a wedge-shaped (point basad) blackish brown shade in upper half of cell; a broad blackish brown shade between cell and inner margin reaching vein Cu₂ and middle of inner margin; an oblique blackish brown postmedial fascia from costa at three-fourths to middle of inner margin, slightly dentate (points terminad) on the veins, and edged distally with bay; a blackish-brown subterminal fascia from just before apex, gradually narrowing, to termen at vein Cu₂; fringe warm sepia. Hind wing bone-brown, fringe warm sepia. Underside of both wings bone-brown, fringe warm sepia. Expanse: 25—27 mm.

Holotype ♂: Belgian Congo, Lake Kivu, Virunga Mountains (9,000 feet), October, 1921 (T. A. Barns).

Paratype ♂: Belgian Congo, between Lake Kivu and Lake Edward, March and April, 1924 (Mrs. T. A. Barns).

Thosea toxozona sp. n. (pl. viii, fig. 3 ♂).

♂. Palpus cinnamon-brown finely irrorated with cinnamon-buff. Antenna honey-yellow, the shaft finely barred with chocolate. Thorax cinnamon-brown to chestnut, tegula tinged with chocolate. Abdominal segments (tergally) cinnamon-brown proximally, chocolate distally, irrorated with cinnamon-buff. Pectus and legs cinnamon-brown irrorated with cinnamon-buff, the legs tinged with chocolate. Venter chocolate irrorated with cinnamon-buff. Fore wing chocolate, costa narrowly wood-brown to just beyond middle, then pinkish cinnamon to just before apex, the tornad edge of this strip distinctly bowed and giving rise from its middle (costa at two-thirds) to a distinct but rather sordid cinnamon-buff, strongly bowed (convexity tornad) fascia, running to inner margin at one-third, thus dividing the wing into two parts, of which the proximal is slightly richer in tone; fringe cinnamon-brown finely edged with light pinkish cinnamon. Hind wing light pinkish cinnamon, lightly tinged with chocolate; fringe cinnamon-brown, finely edged with light pinkish cinnamon. Underside of both wings light pinkish cinnamon, the fore wing widely suffused with cinnamon-brown, the hind wing narrowly so along costa only; fringes as on upper side. Expanse: 30 mm.

Holotype ♂: South Central Angola, Upper Cubango-Cunene Watershed (5,500 feet), October, 1928 (T. A. Barns).

Narosa barnsi sp. n. (pl. viii, fig. 7 ♂).

♂. Palpus cartridge-buff lightly tinged with olive-green. Antenna avellaneous. Head cartridge buff tinged with olive-green. Thorax light buff strongly tinged with olive-green. Abdomen (tergum) light buff strongly suffused with fuscous to fuscous black, anal tuft tinged with olive-green. Venter proximally cartridge-buff, distally fuscous. Fore wing olive-green; a patch of cartridge-buff on inner margin at one-third; a medial ridge of mineral-grey to iron-grey raised curled scales; a black spot on discocellulars, succeeded by a prominent cartridge buff patch (1½ mm. in diameter); from middle of vein R5 a black fascia, sharply oblique to vein M1 at two thirds, thence straight to junction of vein Cu2 with termen; some cartridge-buff scaling subterminally near costa; a narrow strip of cartridge-buff scaling before termen, broadest at apex, with a terminal series of interneural black dots, largest at apex; fringe cartridge-buff strongly tinged with olive-green. Hind wing fuscous black; fringe cartridge-buff tinged with olive-green and sparsely streaked with fuscous black. Underside of both wings fuscous black, fringes as on upperside; fore wing with some cartridge-buff tinged with olive-green along costa and in cell; hind wing with some cartridge-buff tinged with olive-green along costa and inner margin. Expanse: 26 mm.

Holotype ♂: South Central Angola, Upper Cubango-Cunene Watershed (5,500 feet) (T. A. Barns).

Narosa talboti sp. n. (pl. viii, fig. 8 ♀).

♀. Palpus glossy white, shaded with fuscous at base and dorsally. Antenna white. Head and thorax white. Abdomen (tergum) white suffused with fuscous, crests drab. Pectus white. Legs white irrorated with fuscous, the fore leg with coxa and femur heavily suffused with fuscous, tibia and tarsus irrorated with fuscous. Venter glossy white. Fore wing glossy white mottled with fuscous without definite pattern; a broad fuscous irregular antemedial shade; an ill-defined fuscous black postmedial fascia beginning at upper angle of cell, curving (concavity apicad) to a rounded patch at bases of veins M2, M3 and Cu1, with a narrow projection on its distal side costad, enclosing a patch of drab, then from the rounded patch indistinct, narrow and sharply oblique to middle of inner margin; some fuscous subterminal shading; a fuscous to fuscous black terminal fascia interrupted at veins, broadest at veins R4 and R5, broadening again between veins Cu1 and Cu2; fringe drab

irrorated with fuscous and some fuscous black. Hind wing glossy white, with a diffuse delicate fuscous shade beyond end of cell to termen; a terminal series of delicate fuscous lunules; fringe white irrorated with fuscous. Expanse: 24 mm.

Holotype ♀: Belgian Congo, Bafwasende Lindi River (2,000 feet), July, 1921 (T. A. Barns).

Chrysamma syntomoctena sp. n. (pl. viii, fig. 13 ♂).

♂. Palpus auburn, light orange-yellow ventrally. Antenna honey-yellow. Head light orange-yellow tinged with ochraceous orange to xanthine orange, the frons auburn laterally. Thorax auburn, tegula straw-yellow at base. Abdomen (tergum) buff-yellow tinged with russet. Pectus buff-yellow tinged in front with russet, auburn immediately beneath head. Legs and venter buff-yellow tinged with primuline yellow. Fore wing russet (thinly scaled, semi-translucent), the costa auburn, the veins chesnut-brown; an oval glossy white spot from junction of vein Cu2 with cell, outwardly oblique to just beyond middle of inner margin. Hind wing russet, the veins auburn. Underside: Fore wing russet, the costa auburn; some light buff below the cell; the oval spot showing through as a light buff spot; underside hind wing russet, with a light buff longitudinal fascia from base to termen along vein A1. Expanse: 32 mm.

Holotype ♂ and paratype ♂: Central Africa, West Semliki Valley, escarpment 20 miles S.W. of Boga (3,500—4,000 feet); borders of forest and long grass country; July, 1924 (T. A. Barns).

Chrysamma diachrysa sp. n. (pl. viii, fig. 9 ♂).

♂. Palpus tawny, light orange-yellow ventrally and terminally. Antenna warm buff. Head tawny tinged with Sanford's brown. Thorax and abdomen (tergum) tawny. Pectus and legs cinnamon-buff tinged with Sanford's brown. Venter cinnamon-buff. Fore wing translucent, opalescent, vinaceous russet; an antemedial fascia of cadmium-yellow spots, one in lower half of cell just before origin of vein Cu2, one immediately below the first, the third below the anal vein set slightly nearer the wing-base than the others, each spot succeeded by a patch of chestnut; some cadmium-yellow on costa postmedially; a postmedial fascia of six cadmium-yellow spots, set interneurally, from vein M1 curved round the lower angle of the cell, each spot preceded by a chestnut spot; a chestnut shade subterminally from costa to vein M2

just after the first postmedial spot; fringe light orange-yellow edged with vinaceous russet, interrupted at vein-ends by vinaceous russet dashes. Hind wing light ochraceous buff tinged with vinaceous tawny; termen vinaceous russet interneurally; fringe light orange-yellow edged with vinaceous russet, interrupted by vinaceous russet dashes at the vein-ends. Underside: Fore wing vinaceous tawny, fringe light orange-yellow edged with vinaceous russet and interrupted at vein-ends by vinaceous russet dashes; underside hind wing light orange-yellow with vinaceous tawny below cell; termen vinaceous tawny interneurally; fringe light orange-yellow edged with vinaceous tawny. Expanse: 28 mm.

Holotype ♂: Belgian Congo, W. Kivu, Katana (5,000—7,000 feet), highland forest bordering pasture land; beginning of wet season; April, 1924 (T. A. Barns).

Paratypes: Belgian Congo, ♂, N.W. Kivu, Higher Oso Valley (5,000 feet), September, 1921 (T. W. Barns). 3 ♂♂, W. Kivu, South side middle Lowa Valley, South of Walikali, forest (3,500 feet), wet season, March, 1924 (T. A. Barns). 3 ♂♂, W. Kivu, Lowowa Valley, South Lowa District, mountain forest (4,000 feet), wet season, March, 1922 (T. A. Barns).

Chrysamma erythrochrysa sp. n. (pl. viii, fig. 16 ♂).

♂. Palpus cadmium-yellow. Antennal shaft buff-yellow, pectinations honey-yellow. Head, thorax, abdomen (tergum), pectus, legs and venter cadmium-yellow, except for the Indian red tegulae and some Indian red below the eyes. Fore wing Indian red; costa cadmium-yellow; a cadmium-yellow postmedial fascia 1.5 mm. broad except between veins M1 and Cu1, where it is very narrow, the upper part from costa to vein M1 lying beyond end of cell, the lower part from cell to inner margin lying before end of cell; a narrow indistinct light cadmium subterminal fascia, bowed (concavities basad) from costa to middle of vein M3, and again from vein M3 to tornus; termen and fringe light cadmium. Hind wing buff-yellow tinged with light cadmium, fringe light cadmium. Underside of both wings buff-yellow tinged with light cadmium, the fore wing with Indian red in cell and in interspaces from apex to vein Cu2. Expanse: 30 mm.

Holotype ♂: Central Africa, South side middle Lowa Valley, South of Walikali, W. Kivu (3,500 feet), March, 1924, wet season (T. A. Barns).

Delorhachis chlorodaedala sp. n. (pl. viii, fig. 4 ♀).

♀. Palpus light orange-yellow to orange streaked with bone-brown. Antenna light orange-yellow. Head light orange-yellow tinged with orange. Thorax orange-rufous tinged with flame-scarlet with a medial longitudinal fascia of light blue-green; tegula light blue-green edged with orange-rufous to flame-scarlet. Abdomen (tergum) ochraceous orange tinged with orange at base. Pectus ochraceous orange streaked with bone-brown below head. Legs ochraceous orange, the long tibial hair-scales tinged with flame-scarlet. Venter ochraceous orange. Fore wing orange-rufous tinged with flame-scarlet; a light blue-green postmedial fascia, finely edged distally with clove-brown, outwardly oblique from just below costa to junction of vein R5 with R3 + R4, then inwardly oblique to about middle of inner margin, very narrow at vein M1, broadening towards vein Cu2, thence nearly 1.5 mm. wide to inner margin; all veins clove-brown to just before termen. Hind wing warm buff tinged with ochraceous salmon. Underside of both wings warm buff tinged with ochraceous salmon, each with some ochraceous orange along costa. Expanse: 32 mm.

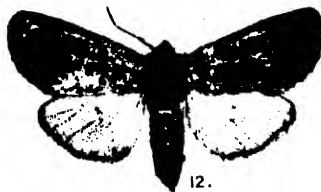
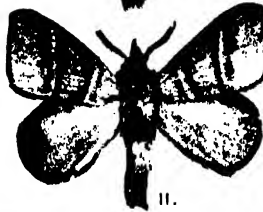
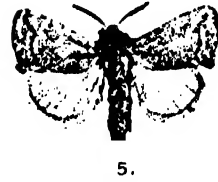
Holotype ♀: Angola, South Bihé District, Benguela Plateau (5,000 feet), November, 1928 (T. A. Barns).

Similar to *D. viridiplaga* Karsch (= *D. charopa* B.-Bkr.), from which it differs as follows:—

Fore wing of *viridiplaga* ochraceous orange, the postmedial fascia vivid green, and except for a few scales between costa and upper angle of cell, extending only from lower angle of cell to inner margin.

EXPLANATION OF PLATE VIII.

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DESCRIPTION OF FOUR INTERESTING NEW AFRICAN MOTHS.

BY W. H. T. TAMS.

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DURING his journey of exploration and research to the region of the great craters in Tanganyika Territory and to the forests, lakes and volcanoes of the South-Eastern Congo, Mr. T. Alexander Barns collected, among other things, a considerable number of interesting moths, some of which were figured in his book on the expedition. I believe these, with the exception of the four species of *Lasiocampidae* described in this paper, have since been described. The expedition was largely due to the generosity and keen interest in entomology of Mr. J. J. Joicey, who has generously presented many of the moths taken by Mr. Barns to the British Museum (Natural History).

Pseudometa oinopa sp. n.

♂. Palpus Kaiser-brown to liver-brown. Antennal shaft liver-brown, pectinations honey-yellow. Head and thorax liver-brown with traces of Kaiser-brown. (Abdomen discoloured in the unique type.) Pectus and legs Kaiser-brown with marked liver-brown shading. Fore wing russet-vinaceous with a pronounced velvety claret suffusion from base to tornus between lower margin of cell + vein Cu2, and inner margin; no definite pattern, but indistinct liver-brown shades obliquely terminad from costa antemedially, postmedially, subterminally and preterminally; a cartridge-buff discocellular streak; fringe claret-brown. Hind wing russet-vinaceous tinged with liver-brown, the area from end of cell to termen between veins M2 and Cu2 mummy-brown; fringe claret-brown. Underside: Fore wing russet-vinaceous lightly tinged with liver-brown, veins tinged with claret-brown except at base and termen; some long buff-pink hair-scales between upper margin of cell and inner margin in proximal half of wing; cartridge-buff discocellular streak; fringe mummy-brown; hind wing russet-vinaceous tinged with liver-

brown, costa broadly suffused with claret-brown; fringe mummy-brown. Expanse: 33 mm.

Holotype ♂: Belgian Congo, Kinchasa, May, 1920 (T.A. Barns).

Figured in: T. A. Barns, *Across the Great Craterland to the Congo* 1923, fig. 82, No. 13.

Streblote craterum sp. n.

♂. Palpus chestnut-brown to liver-brown. Antennal shaft chestnut-brown irrorated with cartridge-buff, pectinations fuscous black. Head and thorax liver-brown to clove-brown with a tinge of aniline black; tegula chestnut-brown to clove-brown, sometimes with some warm buff streaking, and edged with cartridge-buff. Abdomen clove-brown. Pectus wood-brown to liver-brown, sometimes chestnut-brown to clove-brown tinged with aniline black. Venter chestnut-brown to clove-brown. Legs wood-brown tinged with chestnut and irrorated with cartridge-buff, or wood-brown to fuscous and clove-brown, similarly irrorated. Fore wing clove-brown to fuscous black, the veins chestnut to chestnut-brown irrorated with cartridge-buff, the fringe chestnut to chestnut-brown; sometimes with cartridge-buff irroration along inner margin nearly reaching vein Cu₂; traces of a fuscous black antemedial fascia; a fuscous black postmedial fascia roughly parallel with termen, sometimes accentuated with a cartridge-buff edging distally; subterminal fascia irregular, interrupted, composed of interneural cartridge-buff to light buff patches, edged distally with fuscous black. Hind wing wood-brown to fuscous; fringe fuscous. Underside fuscous with a violet sheen in oblique light, and some sparse white irroration. Expanse: 34—36 mm.

♀. Similar to male. The only female available is as dark as the darkest male. Tegula and rest of thorax concolorous. Postmedial fascia of fore wing pronounced from vein R₄ to tornus, honey-yellow (dull). Expanse: 50 mm.

Holotype ♂: Belgian Congo, Kivu, Ninagongo Volcano, October, 1919 (T. A. Barns). Figured in: T. A. Barns, *Across the Great Craterland to the Congo*, 1923, fig. 82, No. 9.

Allotype ♀: Belgian Congo, Kivu, Ninagongo Volcano, September, 1919 (T. A. Barns). Also figured in the above-mentioned work: fig. 82, No. 14.

Paratypes: 2 ♂♂, Ruanda District, Lake Kivu, Rugege Forest (8,000 feet), December, 1921 (T. A. Barns).

Streblote pygmaeorum sp. n.

♀. Palpus light buff mixed with fuscous, tinged with some chestnut laterally. Antennal shaft light buff irrorated with chocolate, pectinations honey-yellow. Head fuscous streaked with light buff, vertex tinged with chocolate. Thorax in front chocolate streaked with light buff, behind vinaceous-russet to tawny tinged with chocolate and streaked with light buff; tegula chestnut edged on inner side with light buff. Abdomen russet tinged with chocolate proximally, mixed with tawny distally, streaked with light to warm buff. Pectus chocolate to vinaceous-russet in front, light buff behind. Venter vinaceous-russet tinged with chestnut, segments edged with light buff. Legs light buff with some long vinaceous-russet hair-scales, fore and mid tibiae and tarsi and hind tarsus streaked with chocolate. Fore wing chestnut-brown, costa edged with light buff; a slightly bowed (concavity terminad) cartridge-buff fascia from costa at two-thirds to vein Cu1 at about 5 mm. from cell, then parallel with inner margin to vein Cu2, then oblique to anal vein at 5 mm. from wing-base, the whole fascia enclosing with costa and inner margin a chestnut area, with a chocolate discocellular spot; a cartridge-buff postmedial fascia, roughly parallel with termen, more conspicuous than the previously mentioned fascia; the area enclosed by these fasciae tinged with chocolate and irrorated with cartridge-buff; an obscure subterminal fascia chestnut proximally to chocolate distally, its outer edge with large serrations the points of which lie on the veins; some cartridge-buff irroration between postmedial and subterminal fasciae and before termen; fringe light buff. Hind wing vinaceous-russet suffused distally with chestnut-brown; veins finely streaked with cartridge-buff; an indistinct postmedial fascia roughly parallel with termen, indicated by a slight increase of cartridge-buff irroration; inner margin and fringe cartridge-buff. Underside of both wings vinaceous-russet tinged distally with chestnut-brown, costa and veins in each case streaked with light buff; fore wing sparsely, hind wing more densely irrorated with cartridge-buff; fore wing with a narrow cartridge-buff postmedial fascia parallel with termen; hind wing with a broader, more diffuse postmedial fascia roughly parallel with termen; termen edged with fuscous; fringes cartridge-buff. Expanse: 64 mm.

Holotype ♀: Belgian Congo, Congo-Semliki watershed, N.E. outskirts of Ituri Forest, 3 days S. of Irumu, February, 1920 (T. A. Barns). Figured in: T. A. Barns, *Across the Great Craterland to the Congo*, 1923, fig. 82, No. 16.

Leipoxais lipohemisma sp. n.

♂. Palpus light buff shaded with fuscous. Antennal shaft light buff, pectinations bone-brown. Head and thorax cinnamon-brown and light buff mixed. Abdomen light buff lightly streaked with cinnamon-brown. Pectus cinnamon-brown mixed with light buff in front, light buff behind. Venter light buff speckled with cinnamon-brown. Legs cinnamon-brown mixed with light buff. Fore wing vinaceous-russet to cinnamon-brown strongly suffused with light buff. Fuscous antemedial fascia, discocellular spot, dentate bowed (concavity basad) postmedial fascia, irregular subterminal fascia and terminal line; fringe cinnamon-brown. Hind wing vinaceous-russet, costal area broadly cinnamon-brown to fuscous finely streaked with light buff; terminal line fuscous; fringe vinaceous-russet mixed with light buff. Underside fore wing vinaceous-russet, upper edge of cell shaded with cinnamon-brown, distal third of wing irrorated with light buff; a fuscous terminal line interrupted at veins; fringe cinnamon-brown; underside hind wing light buff, strongly suffused in proximal third and along costa with cinnamon brown; an irregularly dentate fuscous postmedial fascia; distal two-thirds blotchily irrorated with cinnamon-brown to fuscous; a fuscous terminal line, interrupted at veins; fringe vinaceous-russet mixed with light buff. Expanse: 44 mm.

Holotype ♂ : Belgian Congo, Congo-Seniliki watershed, source of Itoa River (1,300 metres), February, 1920 (T. A. Barns). Figured in : T. A. Barns, *Across the Great Craterland to the Congo*, 1923, fig. 82, No. 12.

This species resembles *L. dives* Auriv., but has much less contrasted colours and markings.

A REVISION OF THE INDO-AUSTRALIAN *CLEORA* OF THE *ALIENARIA* GROUP.

By LOUIS B. PROUT.

(Plates V, VI, VII.)

THE species comprised in the present survey are members of Moore's Geometrid genus *Chogada* (*Lep. Ceyl.* iii, p. 415, 1887), which, as has been pointed out elsewhere (*Ins. Samoa* iii (3), p. 156), cannot be distinguished from *Cleora* Curt. by any definable structural character hitherto discovered, but which nevertheless presents an *ensemble* of characters and a general uniformity in colour-scheme and maculation sufficiently striking to admit of its being singled out for separate investigation. In this sense the group is exclusively Indo-Australian and African, and *Hypopalpis* Guen., founded on a little-known species from Réunion, is probably its earliest sub-generic designation. It is hoped that it may be possible to deal later with the African element; for the present our attention is confined to the Indo-Australian.

For some years past interest in this difficult group has been steadily growing. In Part iii, Fasc. 3, of the *Insects of Samoa* (issued March 24, 1928), pp. 155-7, a brief outline of the state of our knowledge at that time was given, and it was remarked (p. 156) that "the number [of forms] that would require examination before any systematic revision could be made continues to increase rather than to diminish, and we must reluctantly relegate to the future all but the barest generalisations."

The fascination of the study, however, forbade my leaving it in that position, and with the valued collaboration of several entomologists, to whom my indebtedness is here expressed, I believe I have now been able to investigate all the known forms and to make their males, at least, henceforth identifiable. First and foremost, my thanks are due to Mr. W. H. T. Tams, of the British Museum, and Mr. Neville Bennett, of the Hill Museum, for the excellent illustrations of the valves of the ♂ genitalia. In a very special sense, also, I am indebted

to Mr. J. J. Joicey, who has given me every facility for the work, and whose wonderful material from Sumatra, Buru, Ceram and Dutch New Guinea has contributed so largely to its completeness. Mr. H. J. Campbell has assisted by photographing the drawings. Dr. K. Jordan, at the Tring Museum, examined the only known ♂ of *Cleora minutaria* (Leech). Mr. R. Van Eecke, of Leiden, Mr. Corporaal, of Amsterdam, and Dr. M. Hering, of Berlin, obligingly sent me the Snellen species from the Museums to which they are attached.

As the differentiation of the species has been elucidated primarily by the ♂ valves, these alone have been selected for figuring, and the references to the figures are added conspicuously against the names of the species. Unless otherwise indicated, the name-typical race is the one shown. The illustrations, drawn with the Edinger Projector, are from Mr. Bennett, the photographic ones from Mr. Tams. As has been argued repeatedly, each method has its merits; but the intricate and endlessly varied armature (harpe) is well brought out in all our illustrations, though in a few of them a ridge or a fold might be mistaken, without actual specimens or descriptions for comparison, for a spine or sclerotic edge. The magnification is uniform, except in the case of *compectinata*, which has such an exceptionally small valve that some of the detail could not be brought out without a higher magnification. In the interests of brevity I have employed the term sacculus for the heavy ventral part of the harpe, as in the works of Pierce, McDunnough and others.

The genus *Cleora* was erected by Curtis (*Brit. Ent.* pl. lxxxviii, fol. 88) on October 1, 1825, on the genotype *cinctaria* Schiff. (1775), of which unfortunately he only knew the ♀. Otherwise it is probable that he would have noticed the characteristic structure of the ♂ antenna (McDunnough, *Studies N. Amer. Cleorini*, p. 19, 1920). His successors, quite erroneously, transferred the generic name to the lichen-feeding group which is typified by *lichenaria* Schiff. (1775), and the error even crept into Meyrick's work (*Tr. Ent. Soc. Lond.* 1892, p. 105). It was corrected by Warren, who in 1894 (*Nov. Zool.* 1, p. 434) erected *Cleorodes* for *lichenaria*; this was apparently noted by Meyrick, for Hayward (*Lep. Derbyshire*, p. 20) adopts it on his authority (in litt.), but through some inadvertence the misapplied name was reverted to in the *Revised Handbook* of 1927.

From the genotype *cinctaria*, the following diagnosis of *Cleora* has been drawn up:—

Head moderately rough-scaled; face slightly rounded-prominent, the lower part with a projecting tuft, formed by the meeting of long scaling from either side. Palpus moderate, second joint rather long-scaled, especially beneath, third joint shortish-moderate, slightly drooping. Antenna moderate, in the ♂ bipectinate to a little beyond two-thirds, the primary branches placed at the distal end of the segment, mostly long, the first few and last few short, the length increasing or decreasing very rapidly; short and slender (secondary) pectinations at the proximal end of the segment, except for a few of the most shortly-pectinated ones; distal segments very shortly ciliated and each with a short terminal bristle at either side. Antenna of ♀ minutely ciliated and with single bristles. Thorax with very slight double posterior crest. Pectus hairy. Femora not or scarcely hairy. Hind tibia of ♂ moderately dilated, with hair-pencil¹; hind tarsus of ♂ not abbreviated. Abdomen in ♂ rather slender, in ♀ moderately robust; not crested; tergite 1 with a covering of long white scales arising from its anterior edge. Genitalia in ♂ with uncus simple, tapered; gnathos weak; valve (pl. v, fig. 1) rather broad, with costa weakly sclerotized, widened at apex, sacculus heavily sclerotized, forming the lower margin of an ample harpe, which bears a strong spine proximally and irregularly sclerotized distal edge.

Fore wing with termen oblique, gently curved, scarcely waved; fovea in ♂ developed; retinaculum in ♂ moderately long; cell one-half wing-length or very slightly more, DC³ a little incurved; SC¹ and SC² both from cell, well separate, SC² not rarely connected with SC³⁻⁴, R² from slightly before end of cell-vein, M¹ from near R³; scaling rather rough, cell-spot marked with a dense patch of elongate, raised white scales.

Hind wing with termen slightly crenulate or at least waved; cell as on fore wing, DC gently curved; C approximated to cell at second fourth, rapidly diverging. SC² separate, R² wanting, M¹ from near R³.

Probably only the four species (or forms) mentioned in the footnote

¹ This character has only been used as generic by two or three American systematists and is, in any case, quite obviously not so in the present instance; for the hair-pencil is wanting in *C. sublunaria* (Guen.), which is scarcely more than a North American race of *cinctaria*, and *C. manitoba* (Grossbeck, which is also very close. The correlated abdominal spine is wanting in *cinctaria* (at least generally), but is well developed in *insolita* Butl., which represents it in Japan.

to p. 181, together with *leucophara* Butl. (1878), from Japan, conform in every detail to the above characterization, but there is another Japanese species, *venustaria* Tzeech (1891), which is clearly congeneric. These and the rather isolated *fortunata* Blachier (1886), from the Canary Islands and Madeira, are already sufficiently well known and are not near enough to the *alienaria* group to call for inclusion here. Closer to the last-named in facies, but with strongly pectinate antenna in the ♀ also, is the *cornaria* Guen. group (genus or subgenus *Carecomotis* Warr.), which, although Indo-Australian, is held over for consideration on some other occasion. On the other hand, a somewhat wide reach has been given to the name *Chogada* in connection with the *Cleora* of the Indo-Australian Region which have non-pectinate females, and I thought it well to give the outliers "the benefit of the doubt" by noticing them in the present revision.

Cleora alienaria (Walk.), on which Moore has founded his genus *Chogada*, is a more robust species than *cinctaria*, and its characters may be read into our generic diagnosis by the use of a good deal of the "plus" element, concurrently with an almost negligible "minus" in the length of the cells and in the frequency of a connection between SC^2 and SC^{3+4} of the fore wing. Palpus slightly longer and more heavily scaled. Antennal pectinations longer. Hind tibia of ♂ more strongly dilated. ♂ genitalia with stronger gnathos, a strong free arm from the sacculus and other slight distinctions. Hind wing with termen somewhat more crenulate. These cannot possibly be treated as generic, but are worthy of mention because most of the tendencies are carried somewhat further in a number of the Indo-Australian species.

A further development is found in the suppression of the secondary pectinations in a considerable group, very generally with a concomitant lengthening of the primary ones to a quite extraordinary degree. To this group belong all the *Cleora* (*Chogada*) yet known from Continental Africa. It leads on, moreover, to the *Carecomotis* group mentioned above. I have made it a convenient basis, partly (but not entirely) supported by other characters, for a division of my material into two sections: A. Secondary pectinations present. B. Secondary pectinations absent, primary curling about clavola.

Key to the Species.

Antenna of ♂ doubly bipectinate	...	...	...	Section A*
Antenna of ♂ single bipectinate	...	...	...	Section B*

* On account of irregularities, *repetita* Butl. and *perlepidaria* Warr. are keyed under both sections.

SECTION A.

1. Wings with a terminal line	... ..	<i>perlepidaria</i> (No. 19)
Wings with terminal dots or rudimentary dashes	... ..	2
2. Secondary pectinations as long as primary, or fused therewith; ♂ hind wing with extended abdominal flap	... ..	<i>repetita</i> (No. 1)
Secondary pectinations much shorter than primary; ♂ hind wing normal	... ..	3
3. Fovea above with a rosette of black scales	... ..	<i>mjöbergi</i> (No. 2)
Fovea above without a rosette of black scales	... ..	4
4. Hind wing above much more weakly marked than fore wing	... ..	5
Hind wing above continuing essential pattern of fore wing	... ..	7
5. Smaller (35--40 mm.), ♂ hind-tarsus scarcely over half tibia; no exceptional blackish patch surrounding cell-mark of fore wing	... ..	<i>subbarbara</i> (No. 16)
Larger (42--50 mm.), ♂ hind tarsus longer; an exceptional blackish patch surrounding cell-mark of fore wing	... ..	6
6. Scaleless foveal patch on ♂ upperside 3 mm. in diameter; harpe rounded distally (Sumatran)	... ..	<i>micistoscia</i> (No. 18)
Scaleless foveal patch on ♂ upperside much smaller; harpe emarginate distally (Moluccan)	... ..	<i>meccoscia</i> (No. 17)
7. Cell-marks weak, scarcely bordered with black	... ..	<i>lipotera</i> (No. 3)
Cell-marks, or at least that of fore wing, strong, sharply bordered with black	... ..	8
8. Borders beneath extremely dark and broad, on the hind wing obliterating the postmedian line, at least anteriorly	... ..	<i>determinata</i> (No. 14)
Borders beneath less extreme, postmedian of hind wing beneath distinct to costa	... ..	9
9. Hind wing beneath with borders heavy, reaching the postmedian anteriorly; fore wing beneath with cell-spot large, a white spot (except in <i>illustraria acquivoca</i>) present between this and postmedian	... ..	10
Hind wing beneath with borders narrowed,* or, if broader, weak and nearly always dappled with white; fore wing beneath with cell-spot less large, only in <i>fraterna</i> with clean white area between this and postmedian	... ..	13
10. Hind wing beneath white proximally, with cell-spot small	... ..	<i>alienaria</i> ab.
Hind wing beneath blurred or mottled, generally with cell-spot large	<i>nigrifasciata</i> (No. 4)
	11

* Wanting in a very few rare aberrations, at least of *serocata*.

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11. Wings relatively elongate, cell-mark of fore wing above narrow, both outer brown bands of hind wing not mixed with black at fold (Malayan) *pendleburyi* (No. 11) •
 Wings less elongate, cell-mark of fore wing above broad or composite, both outer brown bands of hind wing almost always mixed with black at fold 12
12. Sclerotized end of harpe deeply emarginate (Papuan) *illustraria* (No. 12)
 Sclerotized end of harpe not emarginate (Moluccan) *apista* (No. 18)
13. Subbasal band of fore wing continued on hind wing; borders beneath sharply contrasted; † sacculus with two free arms distally, harpe ending in a scobinate patch *alienaria* (No. 4)
 Subbasal band not continued on hind wing; underside more blurred or mottled; genitalia not as in *alienaria* 14
14. Larger (oftenest 48—50 mm.), robust, apex of fore wing not white; hind tibia over 8 mm.; sacculus arm long, harpe otherwise weak (Sumatran) *xanthorrhages* (No. 10)
 Generally smaller (cir. 44 mm.), less robust, apex of fore wing white; hind tibia less than 8 mm. (rarely over 7); sacculus arm short, harpe distally well sclerotized 15
15. Fore wing with median area narrowed, postmedian line crossing M^2 at about one-third its length; postmedian beneath thickened (Hiu-Kiu) *minutaria* (No. 6)
 Fore wing with median area normal, postmedian line crossing M^2 at much beyond one-third; postmedian beneath rarely thickened 16
16. Fore wing with postmedian line nearest termen at R^1 — R^2 17
 Fore wing with postmedian line nearest termen at or around R^3 *tella* (No. 15)
17. Cell-mark of fore wing above with white, black-edged appendage in cell; beneath very large (Papuan) *hospita* (No. 9)
 Cell-mark of fore wing above with appendage smaller, generally black; beneath moderate or rather small 18
18. Hind wing whitened proximally to the median line (N. India to Formosa) *fraterna* (No. 5)
 Hind wing nearly concolorous from postmedian line almost to base 19
19. Sclerotized end of harpe deeply emarginate, two-pointed (Moluccan) *sevocata* (No. 8)
 Sclerotized end of harpe a small twisted process (Javan and Sumatran) sp. n. (No. 7)

† The general darkening of *A. fumipennis* (the only known *Cleora* from Christmas I.) tends to obscure both those characters.

SECTION B.

1. Wings with a terminal line	...	...	...	<i>perlepidaria</i> (No. 19)
Wings with terminal dots or rudimentary dashes	...	...	...	2
2. Hind wing of ♂ with extended abdominal flap	...	...	...	<i>repetita</i> (No. 1)
Hind wing of ♂ normal	...	...	...	3
3. Hind tibia of ♂ not dilated	...	...	...	<i>displicata</i> (No. 21)
Hind tibia of ♂ dilated	...	...	...	4
4. Fovea above with rosette of black scales	...	...	...	5
Fovea above without rosette of black scales	...	...	...	7
5. Underside with border of hind wing behind the middle strong	...	...	...	<i>decisaria</i> (No. 23)
Underside with border of hind wing behind the middle (or almost throughout) weak or wanting	...	...	...	6
6. ♂ genitalia with extended sacculus arm (Philippines)	...	...	...	sp. n. (No. 22)
♂ genitalia without sacculus arm (Loyalty Is. to Samou)	...	...	...	<i>hemiopa</i> (No. 24)
7. Cell-mark without black circumscription	...	...	...	<i>compactinata</i> (No. 20)
Cell-mark black-edged or wholly black	...	...	...	8
8. Fore wing with termen highly oblique, in ♂ as long* as SM ²	...	...	...	9
Fore wing with termen less oblique or shorter; generally large, with hind wing markedly crenulate	...	...	...	16
9. Hind wing with tuft of raised scales in end of cell	...	...	...	10
Hind wing without tuft of raised scales in end of cell	...	...	...	11
10. Expanse 39—41 mm.; ♂ valve with ventral armature long, a scobinate patch at middle of costal fold	...	...	...	<i>psychastis</i> (No. 25)
Expanse 32—38 mm.; ♂ valve with ventral armature short, no scobinate patch at middle of costal fold	...	...	...	<i>inmemorata</i> (No. 26)
11. Polynesian, almost always under 40 mm., underside without conspicuous line or subterminal band	...	...	...	12
Melanesian-Indian, often over 40 mm., underside generally with conspicuous line or subterminal band	...	...	...	14
12. Very small (27—28 mm.); costa of fore wing shouldered; hind tarsus of ♂ nearly 1 (Society Is.)	...	...	...	<i>myrmidonaria</i> (No. 32)
Rarely very small (29—41 mm.); costa of fore wing almost straight; hind tarsus of ♂ $\frac{2}{3}$ or less (Marquesas Is.)	...	...	...	13
18. Generally larger; hind tarsus of ♂ about $\frac{2}{3}$; postmedian line of fore wing generally excurved at radials (high altitudes)	...	...	...	<i>esoterica</i> (No. 31)
Generally smaller; hind tarsus of ♂ scarcely $\frac{2}{3}$; postmedian line of fore wing not excurved at radials (low altitudes)	<i>collettei</i> (No. 30)

* Measured from apex to end of SM².

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14.	Postmedian line beneath generally faint or wanting; ♂ valve with long sacculus arm and short proximal process	<i>concentraria</i> (No. 27)*
	Postmedian line beneath well developed; ♂ valve with shorter sacculus arm and long curved proximal process	15
15.	♂ valve with the process armed with claws or teeth ...	<i>injectaria</i> (No. 28)
	♂ valve with the process simple, pointed	<i>samoana</i> (No. 29)
16.	Underside suffusedly marked, without any white ...	17
	Underside sharply marked, with some white proximally; darkened borders reaching the postmedian	18
17.	Hind tibia dark-spotted	<i>nausori</i> part. (No. 37)
	Hind tibia not dark-spotted	<i>munditibia</i> (No. 38)
18.	Expanse considerably under 40 mm.	<i>godaffroyi</i> (No. 33)
	Expanse over 40 mm.	19
19.	Borders beneath heavy, dark, unicolorous, crossing (and here obliterating) the postmedian... ..	<i>vitensis</i> (No. 35)
	Borders beneath variegated, relieved with pale parts ...	20
20.	Sacculus terminating in a free arm (New Hebrides) ...	sp. n. (No. 36)
	Sacculus not terminating in a free arm	21
21.	Sacculus with long strong spine	<i>nausori</i> part. (No. 37)
	Sacculus with short weak spine	<i>tongaica</i> (No. 34)

SECTION A.

Antenna of ♂ doubly bipectinate, the secondary pectinations very slender. Palpus with terminal joint generally elongate, somewhat clavate or fusiform, especially in the ♂. Genitalia of ♂ generally large, the sacculus with heavy armature. Wings generally sharply marked. Abdomen nearly always with dark belt.

1. *Cleora repetita* (Butl.) (pl. v, fig. 2, Dutch New Guinea).

Boarmia inflexaria Snell., *Tijd. v. Ent.* xxiv, p. 72, t. 8, f. 2 (1881) (nec Walk. 1860) (Celebes).

Boarmia repetita Butl.; *Ann. Mag. Nat. Hist.* (5) x, p. 232 (1882) (Duke of York I.).

Boarmia epistictis Meyr., *Tr. Ent. Soc. Lond.* 1889, p. 499 (1889) (British New Guinea).

Selidosema epistictis Meyr., *Proc. Linn. Soc. N. Sth. Wales* (2) vi (4), p. 619 (1892) (Queensland).

Chogada epistictis Warr., *Nov. Zool.* iii, pp. 299, 405 (1896); vi, p. 52 (1899) (named aberrations) (Fergusson, Kiriwini, Biak, St. Aignan).

♀ "*Boarmia concentraria* Snell.," *Pagenst. Lep. Bism. Arch.* p. 136 (1900) (Duke of York I.).

Chogada proletaria Swinh., *Ann. Mag. Nat. Hist.* (8) xvi, p. 184 (1915) (Singapore).

Cleora inflexaria Turn., *Proc. Linn. Soc. N. Sth. Wales* xlii, p. 375 (1917) (Melville I., Queensland); Prout, *Ins. Samoa* iii, p. 157 (1928) (Malaya to Solomons).

Expanse 41—55 mm., generally large, especially the ♀♀. Antenna of ♂ rather long, pectinate to little beyond middle, the primary branches a little stiffer and more erect than in the allies; the secondary as long as the primary, very irregular, sometimes almost all fused with the primary, at other times with a considerable number well separate, especially on the proximal segments. Hind tibia of ♂ strongly dilated, the tarsus about half. Wings, at least in the ♂, rather more elongate than normal; fovea not very strong; coloration excessively variable, generally paler in the ♀ forms; postmedian line irregularly crenulate, parallel with termen or slightly less oblique, sometimes more or less sinuous, but never with strong outward projection at the radials; hind wing with cell short (one-third or two-fifths), abdominal region in ♂ expanded, slightly folded, clothed with long hair and without pattern; underside in the ♂ blurred, with the dark borders ill-defined, in the ♀ often more sharply marked.

♂ genitalia with uncus fairly typical, valve long and narrow, expanding a little at end, sacculus free, rather short and blunt, not so highly sclerotic as in the typical group. ♀ ovipositor long, nearly always exerted.

Extremely widely distributed: Malay Peninsula, Nias, Sipora I., Borneo, Talaut, Celebes, Buru, Amboina, Ceram, Great Banda, Teoor, Key, Queensland, Waigeu, Biak, New Guinea, D'Entrecasteaux, Louisiades, Woodlark, Trobriands, Bismarcks, Solomons, to which list many additions will certainly be made. It is possible that the western forms may prove racially separable under the name of *proletaria* Swinh., founded on a pair from Singapore, of which the ♂ has been mended with the abdomen and hind wings of a totally different species (? *colorifera* Prout) (!).

C. repetita is not closely related to any other known species and should probably form, according to the antenna, genitalia and hind wing (cell and abdominal margin) a separate subgenus.

2. *Cleora mjobergi* Prout (pl. v, fig. 3).

Cleora mjobergi Prout, *Sar. Mus. Journ.* iii (9), p. 201 (1926); (11), t. 16, f. 15 (1928) (Sarawak).

Expanse 40—49 mm. Antenna of ♂ pectinate to nearly two-thirds, the primary branches long and lax, the secondary quite short. Hind tibia of ♂ strongly dilated, the hair pencil mixed with bright ochreous, the tarsus considerably less than half. Abdomen without black belt. Wing rather elongate, but with termen more rounded, at least in the ♂, than in *repetita*; fovea rather small, roundish, fairly deep, terminated by moderate "foveal bar," above with a rosette of fine black scales; postmedian line as oblique as termen, but gently sinuous, slightly denticulate outward on the veins; median line generally well-developed, the hind wing proximally to it sharply contrasted, whitish; underside with the dark subterminal shade ill-defined.

♀ paler than the ♂, otherwise similar.

♂ genitalia with valve elongate; sacculus short, with a slightly curved prong from its underside crossing near its base a much shorter appressed process; a scobinate tract distally to the prong.

Only known from Borneo.

The genitalia and the fovea would seem to remove this species also from Section A and associate it rather with Section B, and the antenna suggests a transition. Perhaps, like the preceding, it may be regarded as a separate subgenus.

3. *Cleora lipotera* West (text-fig. 4).

Cleora lipotera West, *Nov. Zool.* xxxv (2), p. 122 (1929) (Luzon).

Expanse 39—43 mm. In shape, coloration and maculation more suggestive of *mjöbergi* than of any other species. On an average smaller. Antennal structure similar. Hind tarsus of ♂ appreciably over three-fifths tibia. Fovea normal, without rosette of black scales. Moderately variable, but with the prevailing tone inclining to cinnamon-drab; fore wing with antemedian line not very oblique; median generally strong, sharply angled round the small and weak cell-mark and excurved at fold, postmedian as in *mjöbergi* or scarcely more sinuate, terminal dots small; hind wing often—as in *mjöbergi*—with basal area conspicuously pale. Underside, especially of hind wing, whiter, the cell-spots annular rather than solid, that of hind wing small; lines, even on fore wing, generally weak, ill-defined, especially posteriorly, that of hind wing narrow, generally incomplete, sometimes wanting.

♂ genitalia quite dissimilar to those of *mjöbergi*, the valve showing the short and broad form prevalent in the succeeding groups; sacculus arm short but strong, its free end rather strongly curved.

Luzon: Haight's Place, Panai, Benguet, at about 7,000 feet altitude.



FIG. 4. —Valve of *C. lipotera* West.

4. *Cleora alienaria* (Walk.) (pl. v, fig. 4).

Boarmia alienaria Walk., *List Lep. Ins.* xxi, p. 370 (1860) (Sylhet, Ceylon).

Walker described this species from a ♂ from Sylhet (coll. Saunders, now in the Oxford Museum) and a pair from Ceylon (coll. British Museum) and there has been considerable confusion as to the holotype. Moore, by figuring Ceylon specimens under Walker's name, making *gelidaria* Walk. its ♀ and adding Ceylon larvae, seems to have assumed that the British Museum specimens were typical, the more so as in the following year (*Lep. Coll. Atk.* p. 245) he erected *fraterna* for the only North Indian form yet recognized by him, making it nearest to Ceylonese *alienaria*. Walker's descriptions can fit both his males, though perhaps better his Ceylon one. Swinhoe, however (*Cat. Lep. Het. Oxf. Mus.* ii, p. 289), gives a ruling on Walker's methods which seems incontrovertible, and in view of this the Sylhet ♂ would of necessity be the holotype, even if Moore's action as first reviser had been more unequivocal than is in fact the case. Fortunately, the confusion is not so serious as I at one time feared would be the case, for the Sylhet specimen proves to belong to the North Indian race of the Ceylon and not to the commoner

fraterna. Through the kindness of Professor Poulton, I have been enabled to make a minute examination of it, and although its abdomen is lost, hind tarsi broken, and the single antenna awkwardly curled, there remain in the shape of the cell-spot, sinuous median line of hind wing, position of postmedian and presence of basal in the same wing, and in particular the clean and strongly-bordered underside, sufficient identification-marks for the practised eye.

Palpus with terminal joint less than half second joint. Antenna of ♂ pectinate to not quite three-fifths, the secondary pectinations pretty regular. Hind tarsus of ♂ well under half hind tibia. Fovea moderate. Fore wing with cell-mark rather broad, composite or with an accompanying mark proximally; proximal band generally strong, continued on hind wing; median shade generally weak, in the ♀ sometimes wanting; postmedian of hind wing not close to cell-mark. Underside in most of the races sharply marked; on the fore wing with the dark border anteriorly reaching the postmedian, behind the middle narrowing rapidly, scarcely or not reaching tornus, apical and mid-terminal white markings ample; on the hind wing with the dark band less broad, though generally complete, with terminal marks sometimes confluent.

♀ much whiter than ♂, the border beneath similar though rather narrower.

♂ genitalia with valve broadest considerably beyond the middle; sacculus arm nearly straight, forming a strong, pointed prong, embracing a toothed plate proximally, then a second but curved prong which runs out to or towards a characteristic scobinate patch at the extremity of the harpe.

With the exception of *a. fumipennis*, the races are not very sharply differentiated, and no attempt has been made to detach the few examples hitherto obtained from the Sunda Islands, &c.

(a) *C. a. alienaria*.

Boarmia alienaria Walk., l.c. (pars typ.) (Sylhet).

Expanse 44—52 mm. Ground-colour in the ♂ often tinged with brownish, or rather strongly dark-clouded between median and postmedian of hind wing. Underside with the dark borders on an average broader than in the following races.

Habitat.—Sikkim and Assam and perhaps the mountains of Borneo and Java; ? Philippines; ? Hainan.

(b) *C. a. gelidaria*.

Boarmia gelidaria Walk., *List Lep. Ins.* xxvi, p. 1537 (1862) (Canara).

Chogada alienaria Moore, *Lep. Ceyl.* iii, p. 415, t. 191, f. 1, 1a, 1b (1887) (Ceylon).

On an average smaller than the preceding (39—47 mm.), the ♀♀, however, not rarely reaching it in size. Generally not quite so darkly marked, but with the abdominal belt very outstanding. Yet extremely variable and perhaps not racially tenable.

As ab. *nigrifasciata* Warren (*Nov. Zool.* xii, p. 432, 1905) described a beautiful aberration with the distal area of both wings and the proximal of the fore wing very heavily dark-banded, the dark borders on the underside reaching the postmedian line throughout, recalling those of *processaria* Walk.

Common in South India and especially Ceylon. In size and general aspect most of the known examples from the Malay Peninsula and some from Java and Borneo nearly agree, besides single examples from Sambawa, Pura and Portuguese Timor.

Larva on *Cinnamomea* (Ceylon, Thwaites, sec. Moore, l.c.).

(c) *C. a. rasanaria*.

Chogada rasanaria Swinh., *Ann. Mag. Nat. Hist.* (8) xvi, p. 184 (1915) (Andamans).

Appreciably yellow-brown above and beneath, with the dark bands ("brown suffusion" of Swinhoe) standing out less sharply on the upper-side than in the preceding races. Even the ♀, which in them is almost always white, partakes of this hue. The single ♂ of which the valve has been examined has the sacculus arm appreciably shorter than in *a. alienaria*.

Habitat.—Andamans, apparently not very variable. The form from Formosa ("*Alcis acaciaria* Bsd." part., Prout, *Ent. Mitt.* iii, p. 268) seems nearer to this than to either of the preceding races.

(d) *C. a. fumipennis*.

"*Boarmia compactaria* Walk.," Butl., *Proc. Zool. Soc. Lond.* 1888, p. 546 (1888) (err. det.) (Christmas I.).

"*Boarmia acaciaria* Bdv. form *cornaria* Guen.," Hmps. in *Monogr. Christmas Island*, p. 70 (1900) (err. det.) (Christmas I.).

Cleora alienaria fumipennis Prout, *Nov. Zool.* xxxv, p. 70 (1929) (Christmas I.).

Much smaller (30—38 mm.) and darker. Antenna of ♂ pectinated appreciably further. Fore wing with apex rather acute, postmedian line rather near cell-spot. Underside suffused with glossy brown, postmedian line rather strong, on hind wing sharply angled in middle, dark borders heavy.

Confined to Christmas Island. The agreement in the genitalia induced me to publish this as a race of *alienaria*, but I suspect it will prove a distinct species.

5. *Cleora fraterna* (Moore) (pl. v, fig. 5).

Chogada fraterna Moore, *Lep. Coll. Atk.* p. 245 (1888) (Darjiling).
 “*Boarmia alienaria* Walk.” Butl., *Ill. Hct.* vii, p. 21 (1889) (err. det.) (Dharmasala).

“*Boarmia acaciaria* Boisd.” part., *Himspn., Faun. Ind. Moths* iii, pp. 264, 265, fig. 137 (1895) (err. det.) ([N.] India).

“*Aleis acaciaria* Bsd. form. *fraterna* Moore,” Prout, *Ent. Mitt.* iii, p. 268 (1914) (Formosa).

“*Cleora alienaria* (Walk.)” Prout, *Journ. Bomb. Nat. Hist. Soc.* xxxi (4), p. 938 (1927) (err. det.) (Upper Burma).

In size, shape and markings very similar to *C. alienaria alienaria*. Palpus with terminal joint in ♂ appreciably longer (at least half second joint). Antenna of ♂ pectinate to fully three-fifths, the secondary branches still more stable. Hind tarsus of ♂ almost half hind tibia. Fore wing with cell-mark narrower or less composite, median area on an average narrower, median line more distal, almost touching postmedian on the fold. Hind wing with termen slightly more crenulate anteriorly, slightly less rounded posteriorly, basal mark undeveloped, median line less sinuous, postmedian rather more proximal. Underside with thicker and less denticulate postmedian, followed by some dark shading proximal to an ill-defined whitish band, the subterminal dark band also ill-defined, often narrow or undeveloped, the white midterminal spot smaller or less clean, the blurred effect of the *ensemble* generally very distinct from that of *alienaria* beneath. Abdominal belt less strong.

♀ unknown, presumably at present indistinguishable from that of *alienaria*. Specimens which I provisionally refer here, on account of the weak or undeveloped basal mark of the hind wing, show none of the other features which should differentiate *fraterna*.

♂ genitalia with valve very different from that of *alienaria*, the sacculus broadened proximally, the free arm rather short, curved and

slightly twisted, the harpe only strongly sclerotized in a small distal tooth or beak. A furca, not found in the allies, is developed, its arms fused to about two-thirds their length.

Moderately variable. A paler, on an average rather smaller (? "dry") form, more weakly marked beneath, is not infrequent.

Common in Sikkin, Bhutan and Assam, but known also from the Punjab (Dharmasala and Kulu), Upper Burma, Tonkin and Formosa.

6. *Cleora minutaria* (Leech).

Ophthalmodes minutaria Leech, *Ent. Supp.* p. 43 (1891) (Loochoo).

♂ ♀, 41-43 mm. Superficially very like a small dark *fraterna* Moore. Palpus with terminal joint in ♂ slightly longer, fusiform, approaching that of the following species. Antenna lost in the only known ♂, a stump of one antenna showing the structure of the neighbouring species. Hind tibia of ♂ strongly dilated, 7 mm. long, the terminal spurs short, the hair-pencil fuscous, the tarsus almost one-half. Fore wing slightly shorter and more rounded terminally than in *fraterna*; fovea normal; ground-colour brownish white, the median area scarcely whiter than the rest, the irroration stronger and more uniform than in *fraterna*; cell-spot narrow; ante- and postmedian lines more approximated than in *fraterna*, the former perhaps slightly less oblique, the latter with a stronger indentation before R¹, narrowing the prong at R¹⁻² (about as in the following species); the bands outside median area fairly broad, but not bright; median line weak, central; apex in the ♂ not whitened. Hind wing slightly better rounded than in *fraterna*; colour distinctions, &c., as on fore wing, but with the proximal area a little paler; teeth of postmedian not very strong. Under-side similar to that of the most suffused *fraterna*; postmedian still thicker, a little more proximal, on hind wing somewhat angled just behind R¹, borders broader, in anterior half reaching the postmedian or (on the hind wing) only separated by a narrow and scarcely paler shade.

♂ genitalia apparently similar to those of the following species, a rather evenly broad, distally up-curved and bifid, sclerotic area representing the sacculus and its free arm, the longer and more acute prong of the fork running nearer to the valve than the short broad one; the sclerotized tip of the harpe is curved and pointed, somewhat as in *fraterna* but longer.

Habitat.—Riu-kiu (= Loochoo) Islands, only the type ♀ (in Mus. Brit.) and a ♂ dated July-August (in Mus. Tring) known at present.

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A larger ♀ in coll. Joicey (ex coll. Brabant) labelled Japan, probably in error, is in some respects similar and may belong here.

7. *Cleora hermaea* sp. n. (pl. v, fig. 6, Sumatra).

"*Cleora concentraria* Snell." Prout, *Ins. Samoa* iii (3), p. 157 (1928) (err. det.).

♂, 44 mm. Palpus nearly 2, terminal joint moderately elongate, somewhat clavate, drooping. Pectinations in ♂ long, the secondary ones well developed, about as in *fraterna*; 40 joints pectinate (type) or one or two less (Sumatra forms, not absolutely constant), apical two-fifths non-pectinate. Hind tibia in ♂ 7 mm. long, tarsus one-half or almost. Fovea normal. General coloration as in the rest of the group, the blackish abdominal belt developed, bisected by a narrow pale crest.

Fore wing moderately elongate, termen less oblique and rather less long than in *alienaria*; cell-mark typically rather narrow, about as in *fraterna* or slightly less sinuous, the circumscription and accompanying cloudings well developed; median area rather narrow, postmedian line with rather long narrow outward prong, the markings altogether very closely like those of *sevocata* Prout; ground colour in the type white with the cloudings and the bands outside the median area ample, fairly dark, the brighter, more cinnamon element only manifest in the outer bands between the radials. Hind wing shaped as in *sevocata*; rather heavily irrorated, slightly less so proximally; markings normal.

Underside blurred, much as in *sevocata*, but with irregular white patches remaining.

♀, 46 mm. Terminal joint of palpus slightly less elongate. Wings perhaps slightly broader than in the ♂. The type white, much more densely and evenly irrorated both above and beneath than most of the group, subquadrate apical and midterminal patches remaining clearer (the former on underside clear); bands much reduced. Not unlike the most powdery forms of *sevocata* ♀, though the resemblance is less striking than in the respective ♂♂.

♂ genitalia with the valve rather broad, the sacculus heavily sclerotized, produced into a moderate curved arm, which approaches the sclerotized tip of the harpe; this is raised and twisted, more complicated than that of *minutaria*.

Java: Tosari, July 5, 1910, holotype ♂, July 4, 1910, allotype ♀ (E. A. Cockayne), both in coll. L. B. Prout. South-west Sumatra: North Korintji Valley, 5,000 feet, September—October, 1921, four ♂♂, two ♀♀ (Pratt brothers) in coll. Joicey, variable, all with more brown

or ochre than the type, the ♀♀ with the irroration less extreme; possibly racial but probably aberrational, the variation in part analogous to that of *sevocata* and others of the group, one ♂ with a broad posterior antimony-yellow streak on the fore wing as in one ab. of *xanthorrhages* Prout.

8. *Cleora sevocata* Prout (pl. v, fig. 7).

Cleora sevocata Prout, *Bull. Hill Mus.* iii (1), p. 35 (1929) (Buru, Ceram).

Perhaps nearest to *hospita* Prout. Of about the same average size or scarcely larger and bearing in some respects (especially the reduced size and the blurred, not sharply and broadly dark-bordered underside) the same relationship to *apista* Prout as *hospita* bears to *illustraria anestiaria* Swinh., the first-named pair being companions in Buru and Ceram, the other in New Guinea and the D'Entrecasteaux Islands. Fore wing with antemedian line more curved than in *hospita*; less oblique, postmedian in general rather more proximal, with its prong at the radials stronger, underside with cell-spot less large, at least on the hind wing, the postmedian generally thicker, on the hind wing rather more angled, succeeded by a less strongly white-banded area. Hind tarsus of ♂ slightly less abbreviated, measuring fully half hind tibia, or very slightly over. Terminal joint of palpus in ♂ nearly as long as second joint, clavate, in ♀ much less long. Antenna of ♂ pectinate to about two-thirds.

♂ genitalia with the valve not quite so broad as in the three preceding, the sacculus "arm" forming the ventral edge of the harpe, which is also sclerotized on its upper edge and forms anteriorly two tolerably equal points with a rather deep and narrow orifice between them.

Habitat.—Buru (loc. typ.) and Ceram.

9. *Cleora hospita* Prout (pl. v, fig. 8).

"*Chogada illustraria* Walk. and ab. *flavipars*, *flavilauta* and *brunneofusa* nov." Warr., *Nov. Zool.* xiv, p. 171 (1907) (Biagi, Upper Mambaré River).

Chogada alienaria hospita Prout, *Nov. Zool.* xxiii, p. 55 (1916) (Mount Goliath).

All the names which have been applied to this species were very defectively imposed and it has never been adequately described.

Warren mistook it for *illustraria* Walk. and merely named three colour-forms, not one of which is peculiar to *hospita* and which in any case have no status under the Code. The present author prematurely founded it on ♀♀ only and made it a race of *alienaria*, which at that time had not been duly delimited, but the characters which were given—the obsolescent border of the hind wing beneath and the narrowed cell-mark of the fore-wing above—are fairly distinctive and help to separate *hospita* not only from *alienaria (vera)* but also from the New Guinea race of *illustraria (anestiaria)* Swinh.).

Expanse 38—49 mm. Palpus, especially in the ♂, rather elongate (nearly 2) and with the terminal joint elongate and clavate, but perhaps not quite so long as in *sevocata*. Antenna of ♂ pectinate to not quite three-fifths, the primary pectinations very long and curled, the short secondary ones well developed. Hind tibia of ♂ relatively long (7 or 8 mm.), hind tarsus less than half (about three-eighths). Abdominal belt generally well developed, brown with two black spots. Fovea normal; fore wing moderately broad; markings normal; cell-mark rather narrow, but generally with companion spot proximally and not rarely with a narrow dash distally; coloration very variable, ground-colour white in most ♀♀ and in one ♂ form, or suffused with fawn-colour (ab. *brunneofusa*) or with cream-buff (ab. *flavilauta*) or on the posterior part of the fore wing with chamois or honey-yellow (ab. *flavipars*), the two brown bands nearly always rather bright and broad in the ♂, in one fine aberration broader and blackish. Hind wing scarcely so sharply marked as in *illustraria*, the cell-spot rather small, generally comma-shaped. Underside with the dark borders much less ample and solid than in *illustraria*, the hind wing with a pale or white band breaking it up, at least posteriorly to R⁹; cell-mark of fore wing very large, of hind wing generally smaller or weaker than in *illustraria*, pale on DC.

♂ genitalia with the valve shorter than that of *sevocata*, relatively broad; armature in part less highly sclerotized, particularly the upper arm of the harpe which is comparatively broad, with only a minute hook at its tip (not shown in the position drawn).

Habitat.—Dutch and British New Guinea and Goodenough I.

10. *Cleora xanthorrhages* Prout (pl. vi, fig. 9).

Cleora xanthorrhages Prout, *Bull. Hill Mus.* iii (1), p. 100 (1929) (South-west Sumatra).

A robust species, only yet known from the fine series obtained by

the Pratts at an altitude of 7,300 feet. The original description has brought out the distinctions from *determinata* Walk. and *pendleburyi* Prout, except as regards the genitalia. Both of them have, *inter alia*, the apex of the fore wing white, which is not the case with *xanthorrhages*. Its drab, grey-mixed underside is also distinctive.

♂ genitalia with valve rather long, its long, curved, sacculus arm distinguishable at a glance from any other yet known in the group; sclerotized tip of harpe very slight, sometimes scarcely noticeable.

Habitat.—Slopes of Mount Korintji, South-west Sumatra.

11. *Cleora pendleburyi* Prout (pl. vi, fig. 10).

"*Cleora determinata* Walk." Prout, *Sar. Mus. Journ.* iii, p. 200 (1926) (err. det.) (Sarawak).

Cleora pendleburyi Prout, *Nov. Zool.* xxxv, p. 70 (1929) (Selangor).

Intermediate in appearance between *fraterna* Moore and *determinata* Walk., the upperside resembling the former in its less rugged markings, narrower cell-spot of fore wing (not placed on such a sharply blackish patch), generally narrower band outside the postmedian of the hind wing, &c., the underside of the ♂ resembling the latter in its very broad and heavy borders, though these are in general not quite so black, and that of the hind wing begins to pale before reaching the postmedian, which stands out thick and strong in an appreciably blacker brown; ♀ underside less heavily bordered than in *determinata*. Palpus less than 2, terminal joint in ♂ quite moderate, slightly clavate. Antenna of ♂ pectinate to less than three-fifths. Hind tibia of ♂ long, tarsus short (little over half). Fore wing with tornus slightly more rounded off than in *determinata*, hind wing looking relatively longer costally, termen very weakly crenulate.

♂ genitalia with harpe heavy and complicated but relatively short, sacculus arm quite unmistakable, curved to about 90° and tapered to form a long spine.

A mountain species, inhabiting the Malay Peninsula, South-west Sumatra and Borneo.

12. *Cleora illustraria* (Walk.) (pl. vi, fig. 11).

Boarmia illustraria Walk., *List Lep. Ins.* xxvi, p. 1539 (1862) (Moreton Bay).

Palpus, antenna, hind wing and fovea nearly as in *pendleburyi* Prout, the palpus perhaps slightly longer, the hind tibia less extreme in length.

The exact number of pectinated segments of the ♂ antenna certainly varies, even in a single locality, the usual number being 38 or 39, while 42 is occasionally reached and the type of *i. aequivoca* Prout even gives 44 (the paratype rather less). In wing-shape and in heavy markings—admixture of black in the bands, strength (generally) of median line of fore wing, continuation of subbasal bands on the hind wing—the contact is much rather with *determinata* Walk. Underside in the ♂ with the borders more blackish than in *pendleburyi*, but not absorbing, as in *determinata*, the cell-spot of the hind wing; in the ♀ with the borders about as in *pendleburyi*, heavier than in *hospita*. The suggestion that *pendleburyi* might be a race of *illustraria* is not tenable.

♀ genitalia with the valve not large for the size of the insect, not (as in *pendleburyi*) materially narrowed distally; the sacculus arm, though curved and strongly sclerotic, is not produced into a long spine; the tip of the harpe is raised, forming a curiously twisted tongue which presents varied effects of shape according to the view-point.

Distribution: Queensland to the Bismarcks (? Solomons).

There is considerable geographical variation.

(a) *C. i. illustraria*.

Boarmia illustraria Walk., l.c. (Moreton Bay).

"*Cleora acaciaria* (? *Boarmia acaciaria* Bdv.)" Turn., *Proc. Linn. Soc. N. Sth. Wales* xlii (2), p. 375 (1917) (err. det.) (Queensland).

Cleora illustraria Turn., *Tr. Roy. Soc. S. Austral.* xlvi, p. 283 (1922) (determination).

44—48 mm. The white ground-colour in ♂ generally somewhat suffused with yellowish, the markings not extremely strong.

Habitat.—Queensland. A ♂ from Dobbo, Aru Islands (in Mus. Tring) may well have been an accidental introduction.

(b) *C. i. anestiaria*.

Chogada anestiaria Swinh., *Ann. Mag. Nat. Hist.* (8) xvi, p. 184 (1915) (British Central New Guinea).

On an average larger, the largest examples in both sexes reaching 53 mm. Ground-colour of ♂ generally pure white, very variable but always very sharply marked, the borders beneath heavier than in *i. illustraria*.

Common in Dutch and British New Guinea. A single ♂ from Fergusson Island (in Mus. Tring) is large and unusually heavily marked.

(c) *C. i. crina* subsp. n.

♂ ♀, 43—50 mm. Near *i. anestiaria* Swinh. in the sharpness of the markings. Abdominal belt blacker. Fore wing with a black line close to base or at least a conspicuous subbasal spot behind SM²; median area rather narrower than in most examples of the other races, in both the typical ♂♂ predominantly yellowish-brown (but probably variable in colour, as in nearly all the allies), in the ♀ white; postmedian with the projection in front of R² strong but narrow. Hind wing with the median line or shade strong, mixed with black, the proximal area concolorous with the median area of the fore wing. Underside in the ♂ with the median area more suffused than in *i. anestiaria*, though less so than in *i. aequivoca* Prout; in the ♀ with the black borders heavier and with more suffusion between these and the postmedian.

Habitat.—New Ireland, February, 1924, two ♂♂ and one ♀ (types); December, 1923, and January, 1924, two ♀♀. A pair from Talasea, New Britain, February-April, 1925, and a ♂ labelled Tulagi, Solomons (Woodford) may be provisionally referred to the same race; the ♂♂ have the median area white.

(d) *C. i. aequivoca*.

Cleora illustraria aequivoca Prout, *Nov. Zool.* xxxv, p. 71 (1929) (Vulcan Island).

♂ above and beneath with smoky suffusion throughout. ♀ above similarly suffused or with some white admixture remaining; beneath with the proximal suffusion slighter, the borders as dark as in the ♂ forms, only with a very slight and narrow pale area between them and the postmedian.

Habitat.—Vulcan Island.

13. *Cleora apista* Prout (pl. vi, fig. 12).

Cleora apista Prout, *Bull. Hill Mus.* iii, (1), p. 35 (1929) (Buru, Ceram).

Scarcely distinguishable from *illustraria anestiaria* Swinh. Median line generally broader and brighter. Underside with the borders broader, sometimes approaching those of *determinata* Walk.

♂ valve more elongate, with the harpe quite different, almost evenly sclerotized on both margins; there is, however, the usual broadening of the sacculus proximally and an irregularly dentate-edged

plate distally, which scarcely shows from a ventral view but comes into prominence from a lateral (external).

Habitat.—Buru (loc. typ.) and Ceram.

14. *Cleora determinata* (Walk.) (pl. vi, fig. 13).

Boarmia determinata Walk., *List Lep. Ins.* xxi, p. 384 (1860) (Sarawak).

Expanse 46—58 mm. Palpus rather under 2, terminal joint in ♂ quite moderate, slightly fusiform. Antenna of ♂ pectinated to or not scarcely beyond middle, the pectinated segments, though numbering over 40, being rather short. Hind tibia of ♂ 8 mm. or slightly more; tarsus slightly under one-third. Build rather robust. Fovea rather strong. Markings coarse and heavy, especially in the ♂. Fore wing with median area rather narrow in the ♂, broader in the ♀; cell-mark broad, having a large extension proximally, sometimes also a slight one distally, so as to become irregularly cruciform, in the ♂ set on a roundish black patch; the broad brown band outside the postmedian generally mixed with black, and with fine pale intersection on the veins. Underside with the blackish borders exceptionally broad, on the fore wing reaching the postmedian (which closely approaches the large cell-spot), on the hind wing absorbing and obliterating the postmedian line and commonly even the cell-spot.

♂ genitalia with the valve large, with harpe rather strongly sclerotized throughout, forming—as is well visible from the outside as well as from the inside of the valve—a two-armed organ with a very much wider orifice than those formed in the other species, such as *sevocata*, *hospita*, *illustraria*, &c.; sacculus arm closely approximated to ventral arm of harpe, in part apparently fused.

Habitat.—Malay Peninsula, Sumatra and Borneo.

15. *Cleora tella* West (pl. vii, fig. 36).

Boarmia tella West, *Nov. Zool.* xxxv (2), p. 119 (1929) (Luzon).

Expanse 42 mm. Palpus fully 2, with terminal joint in the ♂ elongate, fusiform. Antennal pectinations extremely long, curling about the shaft, the secondaries in consequence easily overlooked. Thorax with posterior tuft rather well developed; a band in front of thorax blackish. Hind tarsus in ♂ about one-half tibia.

Fore wing with termen not very oblique; fovea normal; cell-mark quite narrow, not or scarcely surrounded with black; postmedian line

strongly excurved between R¹ and M²; the shades accompanying the lines yellowish-brown, sometimes, at least in the ♂, bright yellow. Hind wing slightly elongate costally, a little more weakly marked than fore wing, with pale costa; cell-mark feeble; no raised tufts of white scales. Underside with dark subterminal bands feeble or moderate, separated from postmedian line by a broader pale band; cell-spots less solid than in most *Cleora*.

♂ genitalia with valve broad, blunt-pointed, the sacculus and its arm pretty typically *Cleora* but with no specially near affinity to any other species.

Habitat.—Baguio, Benguet, Luzon, at 3,000 feet.

Rather strongly variable.

16. *Cleora subbarbara* Prout (pl. vi, fig. 14).

Cleora subbarbara Prout, *Bull. Hill Mus.* iii (1), p. 37 (1929) (Buru, Ceram).

This species and the two which follow may be regarded as a separate subsection on account of the abnormality (for *Cleora*) that the hind wing is much more feebly marked than the fore wing instead of continuing its pattern; an indication of a difference in resting posture (?). Only *tella* West may be regarded as slightly transitional.

Expanse 35—40 mm. Shorter-winged than the other small Buru species (*sevocata*). Structure not dissimilar, but with the ♂ pectinations much less extremely long. Aspect quite different, on account of the shadowy markings of the hind wing, which consist of the cell-mark, postmedian line and one or two subterminal shades. Underside also weakly and suffusedly marked.

♂ genitalia with the valve broad, the fairly long sacculus arm with two teeth on the dorsal side, the harpe not forming such strongly sclerotized prongs at its end and with the bay between them broader.

Habitat.—Buru (loc. typ.) and Ceram.

17. *Cleora meceoscia* Prout (pl. vi, fig. 15).

Cleora meceoscia Prout, *Bull. Hill Mus.* iii (1), p. 50 (1929) (Ceram).

Larger than *subbarbara* (47—50 mm.). Palpus similar. Antenna of ♂ pectinate to about two-thirds (three-fifths in *subbarbara*); hind tibia less strongly dilated, terminal spurs and tarsus less shortened. Fore wing with stronger longitudinal blackish cloud about the cell-spot. Hind wing and underside even more feebly marked than in

subbarbara, except that the fore wing beneath repeats the dark cell-cloud of upperside.

♂ genitalia with the harpe weaker than in *subbarbara*, similarly shaped; sacculus arm less curved, &c.

Habitat.—Central Ceram, at 6,000 feet.

18. *Cleora mecostoscia* Prout (pl. vi, fig. 16).

Cleora mecostoscia Prout, *Bull. Hill Mus.* iii (1), p. 101 (1929) (South-west Sumatra).

Expanse 42—50 mm. Hind tarsus of ♂ slightly shorter than in *meccoscia* (two-thirds tibia). Fore wing with fovea larger, conspicuously scaleless above; the blackish cloud above the cell-spot, especially in the ♂♂, still larger. Hind wing whiter, with postmedian line well developed, crenulate.

♂ genitalia quite different, the sacculus arm scarcely free, almost in circuit with the equally sclerotic dorsal edge of harpe (compare *apista* Prout).

Habitat.—South-west Sumatra, at 7,300 feet.

19. *Cleora perlepidaria* (Warr.) (pl. vi, fig. 17, Angabunga River).

Chogada perlepidaria Warr., *Nov. Zool.* vii, p. 112 (1900) ([N.] Queensland).

Cleora perlepidaria Turn., *Proc. Linn. Soc. N. Sth. Wales* xlii, p. 373 (1917) (North Queensland).

Expanse 36—39 mm. Palpus moderate, terminal joint short in both sexes. Antenna of ♂ with primary pectinations long, curled, secondary ones short and inconstant, apparently in process of atrophy, at most only separate on some of the proximal segments; distal half (or slightly more) non-pectinate. Hind tibia of ♂ moderately dilated; tarsus about two-thirds. Fovea in ♂ strong. Not very variable, the sexes similar, the ♀ only a little whiter or greyer. Scaling rough, the pale scales being suberect, in some lights glistening; ground colour, especially in the ♂, tinged with pale greyish-vinaceous or pale vinaceous-fawn, the posterior part of fore wing and a great part of hind wing sometimes suffused with cinnamon-drab; a rather bright, but not sharply defined, apical patch fawn-colour; cell-mark of fore wing rather narrow, of hind wing generally larger; lines not crenulate, the postmedian of the fore wing with the usual lobe strong, generally acute, a second, but slighter, projection behind M²; this and the development

of an *uninterrupted* terminal line are distinctive; fringes strongly chequered. Underside with the dark borders wanting or shadowy.

♂ genitalia with the valve quite small—about $2\frac{1}{2}$ mm. in length, sacculus arm short, clubbed, rough-edged, a small but stout curved and tapering process from sacculus near base of arm.

Evidently not homogeneous with the rest of Section A, more related to *compectinata* Warr.

Distribution: North Queensland, New Guinea, Goodenough I, and New Britain. Always rare.

SECTION B.

Antenna of ♂ singly bipectinate, the branches generally very long, always lax and curled about the shaft. Palpus with terminal joint generally short. Genitalia of ♂ generally small, valve with less heavy armature than in Section A. Wings rarely so sharply marked as in Section A. Abdomen rarely with strong dark belt.

20. *Cleora compectinata* (Warr.) (pl. vi, fig. 18).

Chogada compectinata Warr., *Nov. Zool.* xiii, p. 141 (1906) (British New Guinea).

Expanse 30—38 mm. Palpus moderate, terminal joint in both sexes short. Antennal pectinations of ♂ much less long than in the rest of the group. Hind leg and fovea about as in *perlepidaria*. Scaling as in that species; much whiter, with a delicate tinge of vinaceous and variably dark-irrorated; postmedian line finely denticulate, little bent; characteristic is the lack of blackish outlines to the white cell-marks, which often show no appreciable outlining, but at most only a faint brownish rim; equally characteristic is the very strong and thick, somewhat oblique black dash behind the white apical spot of the fore wing. A beautiful aberration (ab. *fasciata* Prout, *Nov. Zool.* xxiii, p. 54) has blackish bands proximal to the antemedian and distal to the postmedian lines. Underside with the dark subapical mark, but without dark borders.

♂ genitalia with the valve very small (1.7 mm.), narrow; a short twisted process from sacculus-end, of about the same size as that of *perlepidaria* but rather differently placed; a small subtriangular process proximally, in place of the larger curved one of *perlepidaria*.

Only known from British and Dutch New Guinea.

21. *Cleora displicata* (Walk.) (pl. vi, fig. 19).

Boarmia displicata Walk., *List Lep. Ins.* xxi, p. 389 (1860) (Queensland).

Cleora displicata Turn., *Proc. Linn. Soc. N. Sth. Wales* xliii, p. 377 (1917) (Queensland).

Palpus nearly 2, terminal joint moderate. Antenna of ♂ pectinate to scarcely beyond middle. Hind tibia of ♂ not dilated. Fovea somewhat oval, with a rosette of fine black scales on upperside, rather longer oval than that of *decisaria*, a brow of similar black scales between it and the fold. Fore wing with SC¹ occasionally connected with C.

Variable in size, 32-48 mm. Scaling rather smoother or thinner than in the neighbouring species, whitish with rather regular irroration; the usual lines and shades present, in the terminal area rather strong, median line on fore wing usually weak or obsolescent, post-median of hind wing velvety black in posterior part, cell-mark moderately large, dark-edged or wholly dark. Underside rather clean white, with large black cell-spots and broader dark borders than in *alienaria geliduria*, which otherwise it recalls.

♂ genitalia remarkably distinct, with two (nearly parallel) sacculus arms and weak, distally scobinate harpe.

Habitat.—Queensland. (? Java, ? New Guinea, single specimens perhaps erroneously labelled.)

Hardly variable; an occasional ab. has strong *vittata*-like median line.

22. *Cleora rhadia* sp. n. (pl. vi, fig. 20).

Cleora sp. ("unnamed") Prout, *Ins. Samoa* iii (3), p. 162 (1928) (genit.) (Philippines).

♂ ♀, 32 mm. Closely similar to undersized *decisaria* Walk., agreeing essentially in structure, but with the tufts of raised scales on the hind wing less strong. Colour contrasts in general still less sharp, the brown bands accompanying the ante- and postmedian lines rather less bright; lines as in the least extremely dentate-lined forms of *decisaria*, antemedian of fore wing rather more oblique from cell to hind margin than is usual in that species. Underside with the cell-spots more rounded than in *decisaria*, that of hind wing small; dark borders reduced, only well-developed in anterior halves, though on the fore wing with a narrow subterminal continuation posteriorly.

♂ genitalia with valve very different, notably in having the

sacculus arm much longer than in *decisaria*, its subsidiary teeth undeveloped.

Habitat.—Luzon, Philippine Islands: subprov. Benguet, Palali, 200 feet, December 27, 1912, holotype ♂ (A. E. Wileman); prov. Rizal, Manila (plains) July 11 and 17, 1912, allotype and paratype ♀ (A. E. Wileman); Mount Makeling, one ♂, one ♀ (Baker). All in coll. Brit. Mus. Further examples were, I understand, obtained in the neighbourhood of Manila by Mr. Wileman.

23. *Cleora decisaria* (Walk.) (pl. vi, fig. 21, Goodenough I.).

Boarmia decisaria Walk., *List Lep. Ins.* xxxv, p. 1589 (1866) (Ceram); Swinh., *Cat. Lep. Het. Oxf. Mus.* ii, p. 291 (1900) (synonymy).

? "*Boarmia concentraria* Snell." Pagenst., *Jahrb. Nass. Ver. Nat.*, xxxvii, p. 251 (1884) (err. det.) (Amboina).

Boarmia callicrossa ♂ Meyr., *Tr. Ent. Soc. Lond.* 1889, p. 498 (1899) (British New Guinea).

Chogada lacteata Warr., *Nov. Zool.* iv, p. 247 (1897) (New Britain).

"*Chogada callicrossa* (Meyr.)" Warr., *Nov. Zool.* v, pp. 423, 430 (1898) (with named aberrations) (Key Is.).

Chogada decisaria ab. *nigristigma* Warr., *Nov. Zool.* xii, p. 432 (1905) (Choiseul I.).

"*Cleora illustraria* (Walk.)" Turn., *Proc. Linn. Soc. N. Sth. Wales* xlii, p. 376 (1917) (err. det.) (North Australia, Queensland).

"*Cleora lacteata* (Warr.)" Turn., *Tr. Roy. Soc. S. Austral.* xlvi, p. 283 (1922) (synonymy).

"*Cleora decisaria* (Walk.)" Prout, *Ins. Samoa* iii (3), pp. 157, 161, text-fig. 2 A (1928) (morphology and distribution).

Expanse 28—44 mm., both extremes quite exceptional. Palpus with terminal joint shortish-moderate, stout. Antenna of ♂ pectinate to scarcely three-fifths. Hind tibia of ♂ about 5 mm. long, with hair-pencil; tarsus about 3 mm. Fovea with heavy subtriangular rim (i.e., somewhat angled anteriorly), furnished above with fine deep-black scales, an inner and more rounded ridge, with its convexity upward, enclosing a small roundish rosette of similar black scales which radiate from a white centre. Scaling rough, the hind wing in particular developing two patches of long white scales, one in cell, slightly overlapping the cell-spot, the other between cell-spot and postmedian, and a weaker patch on the posterior half of the white band between postmedian and subterminal. Cell-mark more or less strongly bordered with black. Ground-colour white, cloudings extremely variable, but

rarely gay or intense. Lines rarely much inangled near costa; dentate, the postmedian not extremely outbent at the radials, much more oblique than the antemedian, at SM² acutely dentate outward, then very oblique inward to hindmargin. Underside much less variable, rather glossy, in part (especially outside the postmedian) with slight brownish suffusion; cell-spots blackish, more or less oval, transversely elongate, that of fore wing large, postmedian line well-developed though not thick, much less irregular than above; dark terminal band generally complete, though narrowing and weakening behind, fore wing with apical and midterminal white spots, hind wing at least with midterminal. *Ab. nigristigma* Warr. (1905), rather prevalent in the Solomons but scarcely observed westward of New Guinea, has the cell-spots heavily blackened above. *Ab. colorata* Warr. (1898) has a broad bright band (cinnamon-buff or towards orange-cinnamon) outside the postmedian. *Ab. callicrossa* Meyr. (1889) has the subterminal set on a blackish band. *Ab. suffusa* Warr. (1898) has the blackish band of *callicrossa* but the ground-colour brown. *Ab. particolor* Warr. (1898) has the fore wing posteriorly and the hind wing costally dark-suffused. *Ab. simplex* Warr. (1898) may be ignored as being practically typical. Another outstanding aberration has the median area heavily irrorated with black.

♂ genitalia with the valve short and broad; a characteristic scobinate area, shared only by its immediate neighbours; distal part of sacculus dentate on its upper edge, but not terminating in a definite arm.

Very widely distributed at low or moderate elevations from Malaya to the Solomons. I have records from Penang, Siam, Java, Borneo, Celebes, Luzon, Buru, Ceram, Sumba, Dammer, Timor, Tenimber, Key Island, Queensland, Waigeu, New Guinea (near the coasts), Goodenough, St. Aignan, Sudest, the Bismarcks (very general), and the Solomons (except the western group). A very large ♀ (46 mm.) from West Sumatra, of the *colorata* coloration, may represent a race or a closely related species.

24. *Cleora hemiopa* Prout (pl. vii, fig. 22).

Cleora hemiopa Prout, *Ins. Samoa* iii (3), pp. 160, 161, text-fig. 2 B (1928) (Samoa).

Hardly distinguishable from the most weakly marked forms of *decisaria* except by the genitalia. The patches of raised scales rather less strongly developed, the outermost one of the hind wing scarcely discernible.

Cell-marks usually weakened above and beneath. Borders beneath more or less evanescent posteriorly.

♂ genitalia with the sacculus shorter, its upper edge not so dentate but terminating in a longer prong.

Evidently represents *decisaria* in the Pacific Islands.

(a) *C. h. hemiopa*.

Cleora hemiopa Prout, l.c. (Samoa).

Boarmia psychastis part. Meyr., *Tr. Ent. Soc. Lond.* 1886, p. 211 (1886) (nec pars typ.) (Samoa).

Cell-mark of hind wing subobsolete, represented by a small black dot.

(b) *C. h. quirosi* subsp. n.

♂, 31 mm.; ♀, 35 mm. More dark-dusted, the cell-marks more bordered with black above, larger beneath, almost exactly like some narrow-bordered *decisaria*, but with the genitalia of *hemiopa*.

Habitat.—New Hebrides, the type ♂ in coll. Joicey, a ♀ recently sent to the British Museum by Miss L. E. Cheesman.

(c) *C. h. ecdees* subsp. n.

♂, 33 mm.; ♀, 39—41 mm. Larger, especially in the ♀, slightly longer-winged, whiter, both above and beneath; median line straighter in the ♂ (probably an individual aberration), obsolete in the ♀; fore wing with longitudinal dark postmedian mark in front of R^3 developed; cell-mark of hind wing intermediate between those of the other races; subterminal bands beneath still further weakened than in *h. hemiopa*.

Habitat.—Lifu, Loyalty Is., one ♂, three ♀♀, in Mus. Tring.

25. *Cleora psychastis* (Meyr.) (pl. vii, fig. 23).

Boarmia psychastis Meyr., *Tr. Ent. Soc. Lond.* 1886, p. 211 (1886) (New Hebrides).

Generally larger than *decisaria*, fore wing less broad, with termen more oblique, especially in the ♂; fovea without rosette of black scales; lines of fore wing more angled inward anteriorly; median on both wings rather proximal; subterminal dark marks at the radials on the whole better developed; hind wing with raised scaling more as in *hemiopa*; underside with the cell-spots enlarged.

♂ valve with the sacculus and the scobinate patch quite differently formed from those of *decisaria* and its closest allies.

The fortunate discovery of the ♂ by Miss L. E. Cheesman has established the presence, side by side, of two nearly allied species in the New Hebrides and enabled me to correct my earlier, provisional union of *psychastis* with *decisaria* (*Ins. Samoa* iii, p. 154).

26. *Cleora immemorata* (Walk.) (pl. vii, fig. 24a).

Boarmia immemorata Walk., *List Lep. Ins.* xxvi, p. 1540 (1862) (New Caledonia).

Boarmia lichenina Butl., *Ann. Mag. Nat. Hist.* (4) xx, p. 358 (1877) (Lifu, Loyalty Is.).

Cleora immemorata Prout, *Ins. Samoa* iii (3), p. 159 (1928).

On account of the extreme dearth in this country of Geometrid material from New Caledonia, next to nothing has been known of Walker's *immemorata*, founded on one ♂ from "Mr. Macgillivray's collection." This measures 35 mm. Palpus longish-moderate, 3rd joint shortish-moderate, slightly drooping. ♂ antenna pectinate to well beyond two-thirds. ♂ hind tibia with moderate pencil, tarsus about two-thirds tibia. Fore wing with termen very oblique; fovea normal, rather strong; scaling rough; irroration moderately heavy; antemedian line strongly out-bent in cell; median sharply black and with long prong outward round the rather weak cell-mark and with a longitudinal extension to termen in front of R³; postmedian rather strongly indented between SC⁵ and R¹; a whitish spot in cellule 5 between median and postmedian. Hind wing with raised scaling placed as in *decisaria*, perhaps not quite so strong. Underside more suffused than in *decisaria*, from which the narrower fore wing and simpler fovea further distinguish it. A similar ♂ in the Joicey collection was until quite recently the only topotypical example known to me. A small *lichenina*-like ♂ (i.e., without the strong median line and its extension, has, however, now been found in the Oberthür collection, labelled merely "N.C." Thus neither in the wing-markings nor in the valve am I at present able to point to any racial distinctions in *lichenina*, which I judge chiefly from a short series from Lifu in the Tring Museum. These measure 32—38 mm. and have in general the sober colouring and weak median line of *concentraria*, from which they differ chiefly in their smaller size and proximally more suffused underside, with intenser cell-spots. In the hope that the genitalia might reveal some racial distinction, the ♂ valve of one of them has been figured at pl. vii, fig. 24b as *C. immemorata lichenina*. Both show the same

characteristic pair of prongs at the end of the sacculus and arm from behind (inside) it proximally.

It should be added, nevertheless, that Butler's type of *lichenina*, unfortunately a ♀, is larger than the above, with a bright outer band much as in *decisaria* ab. *colorata* and a somewhat *decisaria*-like underside (terminal band rather strong and even), and until this is matched there is no certainty that I am using the name *lichenina* correctly.

27. *Cleora concentraria* (Snell.) (pl. vii, fig. 25).

Boarmia concentraria Snell., *Tijd. v. Ent.* xx, p. 40, t. 3, fig. 20 (1877) (Java); p. 74 (Sumatra).

Palpus moderate, terminal joint small. Antenna of ♂ pectinate to scarcely beyond the middle. Hind tibial hair-pencil not extremely heavy; hind tarsus of ♂ two-thirds tibia. Fovea strong but simple. Fore wing rather more elongate than in *decisaria*; median line weak or blurred, oftenest obsolete except for a costal spot. Hind wing without tufts of raised scaling. Underside less sharply marked than in *decisaria*, the borders variable, less uniform in breadth than in most *decisaria*, tapering or obsolete posteriorly. ♀ whiter (generally much whiter) than in *injectaria*, postmedian line beneath faint or wanting.

♂ valve rather narrow, especially in distal part; sacculus with a moderate, curved arm; a short single process proximally. *C. praira* Prout, described as a species, is obviously a mere race; the genitalia show no differences.

(a) *C. c. concentraria*.

Boarmia concentraria Snell., l.c. (Java).

Boarmia invalidaria (part. ?) Snell., *Iris* viii, p. 147 (1895) (North-east Sumatra; Java).

Expanse 38—41 mm., an occasional dwarf ♂ only 36 mm. Extremely variable; white, with the usual brownish bands more or less developed; or more or less strongly suffused with brown; or the median predominantly blackish; or—ab. *thelia* Th.-Mieg., *Miscell. Ent.* xxiii, p. 52 (1916)—white in the median area, strongly brown proximally and distally; cell-marks at times filled in with black.

Abundant on Java, obtained sparingly also from Sumatra and Lombok; "Halmahera" (Pagenstecher, *Abh. Senckenb. Ges.* xxiii, p. 453) presumably rests on a misidentification (? *decisaria*).

Concerning *invalidaria* much uncertainty arises, as Snellen seems

to have had a very mixed impression of the species. In Zool. Mus., Amsterdam, he labelled *determinata* and *alienaria* as *invalidaria*, but his original series from North-east Sumatra in Zool. Mus., Berlin, consists of a pair of *determinata*; his size measurement and reference to both sexes speak for *concentraria*, his comparison with the American *Boarmia validaria* Guen., and his Amsterdam determinations more suggest *determinata*. Fortunately, however, all the species in question were already furnished with names.

(b) *C. c. praia*.

Cleora praia Prout, *Bull. Hill Mus.* ii (3), p. 251 (1928) (N. Celebes).

Rather larger on an average (42—51 mm.). Postmedian of fore wing more markedly dentate in anterior half. Underside with smaller cell-spots than in *C. concentraria*, notably on hind wing; dark borders narrower. All the five specimens which I have yet seen are rather soberly coloured, showing little variation, but it is likely that longer series may break into this constancy.

Habitat.—N. Celebes.

(c) *C. c. inobeda* subsp. n.

♂, 32 mm. Hind leg apparently relatively longer than in *c. concentraria* (as long as in a specimen one-fifth larger). (Antenna lost.) Valve with the proximal part of the sacculus apparently broader. Fore wing with termen slightly more rounded. Hind wing with tufts of raised scales better developed, almost as in *decisaria*. Both wings with postmedian rather less strongly outbent than in *c. concentraria*; underside with proximal part more suffused with brownish. The unique type otherwise much like rare aberrations of *concentraria* in which the cell-marks are largely obscured with black.

Habitat.—Nias, type in Mus. Tring.

This should perhaps be treated as a species, but without dissection the slight differences in structure may have been misjudged.

28. *Cleora injectaria* (Walk.) (pl. vii, fig. 26).

Boarmia injectaria Walk., *List Lep. Ins.* xxi, p. 376 (1860) (Ceylon).

Palpus longish-moderate, very heavily scaled; third joint moderate, largely concealed by scaling of second. Antenna of ♂ bipectinate to considerably beyond two-thirds. Hind tibia of ♂ about 6 mm.; tarsus two-thirds or under. Fovea normal, rather large. Wings rather narrow, especially the fore wing; raised scaling limited to the cell-

marks, which are narrow; coloration in the ♂♂ nearly always dark, in the ♀♀ less so, often much whiter; antemedian line excurved anteriorly, farther from base posteriorly than in *alienaria*; median line generally well developed; postmedian of hind wing scarcely crenulate, markedly bent in cell; underside with postmedian line rather thick, the dark borders, on account of the dusky suffusions, rarely very outstanding, midterminal white spots nearly always small or weak, often suffused or even obsolete.

♂ genitalia unmistakable, the combination of the pointed, though not very long, sacculus arm with the curious clawed process of the harpe being found in no other species. The details of the armature of this process may be useful for racial differentiations, but unfortunately there is also individual variability therein.

Distribution: Ceylon to Fiji, but still undetected in very many probable localities.

(a) *C. i. injectaria*.

Boarmia injectaria Walk., l.c. (Ceylon).

Boarmia sublectaria Walk., *List Lep. Ins.* xxvi, p. 1535 (1862) (Ceylon).

Boarmia compactaria Walk., *List Lep. Ins.* xxvi, p. 1538 (1862) (Penang).

Chogada injectaria Moore, *Lep. Ceyl.* iii, p. 416 (1887) (Ceylon).

Walker described this species twice from Ceylon, the ♀ in 1861 as *injectaria*, the ♂ in 1862 as *sublectaria*. It does not, however, seem at all common on the island, and I have not been able to examine enough material to indicate any differences from the variable Malayan *compactaria*, though the Ceylonese may be on an average more dusky. The distinction in the harpes shown in *Ins. Samoa* iii, p. 160, text-fig. 1B—4 spikes in *injectaria*, 3 in *compactaria*—proves inconstant, the Ceylon example having only 3 on the left valve.

Average expanse 40—44 mm. ♂ above generally dingy fuscous, with paler areas remaining, the lines strong, black; beneath more blurred, the terminal pale spots small and impure, often obliterated.

♀ with whiter ground-colour, but with rather strong fuscous irroration and generally with heavy dark markings, or sometimes strongly dark-clouded; the Ceylon ♀♀ may be darker than the Malayan. A rare aberration, known in both sexes, is parallel to *alienaria* ab. *nigrifasciata* and *concentraria* ab. *thelia*.

Distribution: Ceylon, Lower Burma, Andamans, Malaya, Borneo,

Celebes (one ♂ only known to me), ? Manovolka (one small, rather grey ♂), ? Tenimber Islands (one small, rather pale ♀).

(b) *C. i. fuliginosa*.

Chogada fuliginosa Warr., *Nov. Zool.* i, p. 436 (1894) (Engano).

A rather small form, almost melanic, even the ♀ being strongly darkened. The few ♂♂ known have mostly lost their hind legs, but the one which retains them has the tibia 5 mm. long, the tarsus 3.

Only definitely known from Engano. Two Mentawai pairs may be provisionally referred to it, though their ♂ hind tarsus seems relatively somewhat longer.

(c) *C. i. vittata*.

Chogada vittata Warr., *Nov. Zool.* vi, p. 349 (1899) (Rossel I.).

? "*Cleora compactaria* Walk." Turn., *Proc. Linn. Soc. N. Sth. Wales* xlii, p. 376 (1917) (Queensland, New South Wales and West Australia).

Perhaps not very sharply differentiable from the name-typical and Penang forms, but rather smaller and producing a much higher percentage of sharply marked examples, the dark parts black rather than brown; median line particularly accentuated, at times thickened, commonly with a longitudinal extension distally in front of R^2 , as in typical *immemorata*. Underside even in the ♂♂ a good deal mixed with white, midterminal white spot clean, though small. Harpe of the ♂ valve, so far as examined, with only two spikes.

Louisiades: Rossel I., fairly common. The Queensland form is perhaps better associated with this than with the Malayan, but probably it will require a separate name.

(d) *C. i. dobboënsis*.

Cleora injectaria dobboënsis Prout, *Nov. Zool.* xxxv (1), p. 71 (1929) (Aru Is.).

Larger and broader winged, superficially recalling *C. illustraria*; median area a good deal mixed with whitish, cell-marks strongly black-rimmed, median line not very black; postmedian of fore wing as in *i. vittata*.

Aru Islands: Dobbo.

(e) *C. i. anidryta*.

Cleora injectaria subsp. Prout, *Ins. Samoa* iii (3), pp. 157, 160, text-fig. 1c (1928) (Fiji) (genit.).

Cleora injectaria anidryta Prout, *Ann. Mag. Nat. Hist.* (10) iii, p. 596 (1929) (Fiji).

Fore wing not quite so narrow as in *i. injectaria* and *i. vittata*. Underside with pale or white terminal markings extended, the dark subterminal band being narrowed. ♂ valve with sacculus arm somewhat shortened, the process (harpe) also shortened, two-spiked.

Fiji.

(f) *C. i. (?) processaria*.

Boarmia processaria Walk., *List Lep. Ins.* xxi, p. 372 (1860) (Burma: Moulmein).

Unfortunately founded upon a ♀, the only specimen yet known to me from Moulmein, broad-winged but otherwise much like some pale Malayan ♀♀. It can with considerable plausibility be referred to the present collective species, but does not, as I wrote in *Ins. Samoa* (iii, p. 156), provide its "oldest" name, the name *injectaria* having been published simultaneously with it. It is therefore important to apply the principle of the International Code of Zoological Nomenclature and make a "first reviser's" selection, and in the interests of stability I unhesitatingly give precedence to *injectaria* Walk.

The form to which I apply provisionally the name of *processaria* is distinguished thus:—

♂ antenna pectinated less far down the shaft; ♂ hind tarsus rather longer; broader winged, whiter, postmedian line rather further from cell-spot, underside with borders rather more sharply differentiated, reaching the postmedian line, the proximal area less suffused, mid-terminal spot less small.

Apparently very rare: Darjiling, 2 ♂♂ in Mus. Tring; Shillong, one ♀ in coll. L. B. Prout; Nagas, one ♂ in Mus. Tring; ?? Mindanao, a darker ♀ in coll. Joicey.

Superficially it is very difficult to reconcile this form with *injectaria*, and although the genitalia have shown no significant difference it is still very possible that it will prove fully distinct.

29. *Cleora samoana* (Butl.) (pl. vii, fig. 27).

Boarmia samoana Butl., *Tr. Ent. Soc. Lond.* 1886, p. 433 (1886) (Samoa).

Boarmia acaciaria samoana Rebel, *Denksch. K. Akad. Wiss. Wien, Math.-Nat. Kl.* lxxxv, p. 429, t. 18, f. 5, 6, 15 (1910) (Samoa).

Cleora samoana Prout, *Ins. Samoa* iii (3), p. 158, t. 5, f. 1—18 (1928) (Samoa).

Structure nearly as in *injectaria*, of which it is probably a representative, though no longer a race. Antenna of ♂ pectinate to three-quarters. Browner than *injectaria*, the underside oftenest with the broad borders of *processaria*, though these are brown, not blackish. Extraordinarily variable, but impossible to confuse with the only other known Samoan *Cleora*, *hemiopa* Prout.

♂ genitalia with the valve similarly shaped to that of *injectaria*, the sacculus arm strongly truncate, that of the harpe simple, only spiked at the tip.

Samoa Islands and Tonga, Friendly Islands.

30. *Cleora collenettei* Prout (pl. vii, fig. 28).

Cleora collenettei Prout, *Entom.* lxii, p. 255 (1929) (Marquesas Is.).

Expanse 29—39 mm., the average size rather small. Palpus almost 2, heavily scaled, terminal joint shortish-moderate. Antenna of ♂ pectinate to three-quarters or four-fifths. Hind tibia of ♂ strongly dilated; tarsus scarcely three-fifths tibia. Abdomen with paired dorsal spots, the first pair largest. Fore wing narrow, termen long, strongly oblique; fovea rather large; prevailing tone brownish, paler and much more uniform than in *samoana*, generally weak-marked, the shades accompanying the lines faint or, when strengthened, grey rather than brown; cell-mark narrow; median line narrow; postmedian line not or scarcely excurved at the radials. Underside also rather uniform; cell-spots not very large or intense; subterminal band narrow and slight, or obsolete; terminal area narrowly pale.

♂ valve rather narrow, with short curved sacculus arm and moderate proximal process.

Marquesas Islands, distributed, chiefly from sea level to about 1,200 feet.

31. *Cleora esoterica* Prout (pl. vii, fig. 29).

Cleora esoterica Prout, *Entom.* lxii, p. 255 (1929) (Marquesas Is.).

Evidently a mountain development of *collenettei*. On an average larger (36—41 mm.), palpus with the third joint perhaps a little shorter and blunter. Antenna with a slightly longer distal part non-pectinate. Hind tibia of ♂ less strongly dilated, tarsus less abbreviated (three-quarters or almost). Hind wing with termen rather more noticeably crenulate. Coloration darker in the ♂, more sharply marked in the ♀, cell-marks strengthened, postmedian line generally more sinuous, termen beneath less definitely pale. More variable than *collenettei*.

♂ valve scarcely distinguishable except in its larger size; its tip, in the specimens mounted, less narrowed.

Marquesas: Hiva Oa, at 3,500 feet.

32. *Cleora myrmidonaria* (Guen.) (pl. vii, fig. 30).

Tephrosia myrmidonaria Guen., *Spéc. Gén. Léop.* ix, p. 271 (1858) Oberth., *Et. Léop. Comp.* ix (1), fig. 1916 (1913) (O-Tahiti).

Smaller and darker than *colletetii*. Palpus and antenna similar. Hind tibia of ♂ much less strongly dilated; tarsus little shorter than tibia. Fore wing relatively less narrow, costa appreciably more arched termen less elongate; fovea strong; irroration rather heavy, at least in the ♂; cell-mark narrow, but with a good deal of black around it, especially distally, this and the postmedian more recalling *injectaria* than *colletetii*; the brown shades accompanying the lines discernible, but fuscous duplicating lines developed, as in some strongly marked *samoana* or *colletetii*. Hind wing not crenulate, only with slight sinuses at radial fold and near tornus. Underside as weakly marked as in *colletetii*, but with the pale border represented by apical and mid-terminal spots.

♂ valve small, narrow, similar to those of the two preceding; sacculus arm and process more approximated.

Society Is.: Tahiti, the "St. George" Expedition examples taken at 1,500 and 2,500 feet.

33. *Cleora godeffroyi* (Butl.) (pl. vii, fig. 31).

Boarmia godeffroyi Butl., *Tr. Ent. Soc. Lond.* 1886, p. 433 (1886) ("Rockhampton").

It is legitimate to feel some doubt as to the correctness of the given locality for this species, which is only known from the originals, a ♂ and ♀ received from the Godeffroy Museum. I can find no trace of it in the works of Dr. A. J. Turner, and it is well known that the same consignment contained also material from the Pacific Islands. Apparently the specimens were sent labelled with numbers only and the corresponding localities written out at the British Museum. The hind wing, the underside and the character of the ♂ genitalia suggest some such position as that which I have here assigned it, and an unnamed ♀ from Ruk (= Truk, Caroline Is.), ex coll. Oberthür, is curiously similar, though larger.

Expanse 34—35 mm. Palpus 1½, second joint somewhat curved, third moderate, drooping, partly concealed. Hind legs lost in the ♂, its abdomen inadvertently destroyed in extracting the genitalia. Build moderately robust. Fore wing with termen moderately long and oblique, transitional between the following group and *injectaria*; fovea weak; markings much as in *injectaria*, the proximal subterminal spots obsolescent excepting a small pair between the radials; the type ♂ brown, the ♀ whiter with more fleshy suffusions. Hind wing relatively rather ample, with termen crenulate. Underside suffused with pale fleshy brown; whiter about the cell spots and in apical and midterminal spots, the latter on the hind wing subconfluent with a tornal one; cell-spot large and round; postmedian well developed, on hind wing rather strongly excurved in middle; distal area shaded with deeper fleshy-brown, deepest (more fuscous) subterminally.

♂ valve less narrow than in the preceding group, the small sacculus arm straighter, the process from behind (above) the broadened part of the sacculus broad and truncate, suggesting no very close relationship to any other yet known.

34. *Cleora tongaica* (Butl.) (pl. vii, fig. 32).

Boarmia tongaica Butl., *Tr. Ent. Soc. Lond.* 1886, p. 432 (1886) (Tonga I.).

Larger than the preceding species (43 mm.), termen of fore wing slightly less oblique. Palpus apparently similar or slightly rougher-haired (head damaged). Hind leg (♂) rather long, tibia 8 mm., strongly dilated, tarsus 5 mm. Fovea not very strong. Ground-colour in the type whitish tinged with buff; the lines and accompanying bands strong, dark-brown, the median connected in middle with postmedian by some dark shading; the black border of the cell-mark on the fore wing broader distally than proximally; postmedian of fore wing rather oblique inward to middle of cellule 6, the outward curve shallow, the denticulations not very strong; subterminal shadings stronger than in *godeffroyi*. Hind wing rather strongly crenulate. Underside much as in *godeffroyi*, the cell-spot relatively not quite so large, the postmedian rather more angled on hind wing, a more noticeable dark shade immediately outside it, a whitish subterminal patch on hind wing from abdominal margin to near M¹.

♂ valve with sacculus rather weak, a small composite arm from quite near its base; a strongly marked sacculus fold (more pronounced

than the usual costal fold), characteristic also of the rest of the group of robust species which it ushers in, only excepting *cheesmanae*, which is possibly misplaced.

35. *Cleora vitensis* (B.-Bakr.) (pl. vii, fig. 33).

Aleis vitensis B.-Bakr., *Proc. Zool. Soc. Lond.* 1905, p. 93, t. viii, f. 5 (1905) (Fiji).

Boarmia vitensis Rebel, *Denkschr. Ak. Wiss. Wien, Math.-Nat. Kl.* lxxxv, p. 429 (1910) (Fiji).

Expanse 44 mm. Palpus $1\frac{3}{4}$, stout, terminal joint exposed, relatively short and stout. ♂ antenna pectinate to well beyond two-thirds. Hind tibia of ♂ nearly 8 mm., strongly dilated; tarsus about 4 mm. Fore wing with termen curved, not extremely oblique; fovea undeveloped; in both the known examples warm brown, without any white except on the narrow cell-marks and separated subterminal lunules; circumscription of cell-mark rather large but not intense; postmedian strongly bidentate anteriorly to the prong at the radials, which is rather strong; presubterminal spots small. Hind wing crenulate, about as in *goleffroyi*. Underside much as in *tongaica*, but with the large cell-spots of *goleffroyi*, the dark terminal band more solid and uniform than in either and with some diffusion crossing (and here almost obliterating) the postmedian behind the cell-spot, more or less continued to the base of the cell.

♂ genitalia with the valve still simpler than in *tongaica*, wanting the proximal process; in size and shape and the foldings near base of sacculus not dissimilar.

Habitat.—Fiji.

36. *Cleora cheesmanae* sp. n. (text-fig. 5).

♂, 37—44 mm., ♀, 44—48 mm. Palpus $1\frac{3}{4}$ or slightly over; terminal joint longish-moderate. Antenna rather long. Hind tibia of ♂ 7.5—8 mm., with strong pencil and dark-mottled outside, terminal spurs short; tarsus 4.5—5 mm. Abdomen with the dorsal pattern rather weak. Fore wing moderately broad, termen curved, crenulate, only moderately oblique; fovea moderate; brown, warmer in the ♂ (much as in *vitensis*), considerably paler in the ♀, in both sexes variegated and variable; the blackish irroration or minute black strigulae strongest about the veins; cell-mark very small and narrow, set on a rather large, roundish black or grey patch; antemedian usually forming spots on the veins, strongly excurved in anterior part, accompanied

proximally by a brown or blackish line; median brown or blackish; postmedian crenulate and sinuous, forming a noticeable bay between R^4 and SM^2 ; the shade beyond ochreous-brown or dusky; shades of subterminal more or less strong between the radials, generally also towards tornus; an apical white spot and one between cell-spot and postmedian strong in the ♀♀. Hind wing crenulate; cell-mark an extremely slender comma, sometimes almost a dot, its black shading restricted mainly to a dash (as also in *vitensis*); median line straightish; postmedian rather irregularly dentate, a black spot at fold (or sometimes a



FIG. 5.—Valve of *C. cheesmanae* Prout.

blackish band) outside it. Underside more buff-tinged proximally, more fleshy outside the postmedian; cell-spots large, deep black; a white spot on each wing between them and the heavy, sinuous postmedian; variable blackish subterminal shading, in the ♀♀ commonly extended; pale or white apical or midterminal marks, on hind wing also one outside the postmedian posteriorly.

♂ valve unexpectedly divergent from that of *vitensis*, having developed a highly sclerotized sacculus arm.

Habitat.—S. New Hebrides (Miss L. E. Cheesman), three ♂♂, four ♀♀, in coll. British Museum.

More variegated than *vitensis*, which moreover has the postmedian of the fore wing almost straight from the radial prominence hindward, the white cell-mark of hind wing less short, the black markings beneath less intense, with the subterminal bands greyish fawn, broad and nearly solid, recalling the *illustraria* pattern; otherwise very similar.

37. *Cleora nausori* (B.-Bakr.) (pl. vii, fig. 34).

Alcis nausori B.-Bakr., *Proc. Zool. Soc. Lond.* 1905, p. 94, t. viii, f. 6 (1905) (Fiji).

Boarmia nausori Rebel, *Denkschr. Ak. Wiss. Wien, Math.-Nat. Kl.* lxxxv, p. 429 (1910) (Fiji).

Expanse: ♂, 40—45 mm.; ♀, 48—50 mm. Palpus 1 $\frac{3}{4}$ or almost 2, terminal joint moderate, exposed. Antenna rather long, in ♂ pectinate to scarcely two-thirds. Hind tibia of ♂ about 9 mm., rather strongly dilated, dark-mottled on outer side; tarsus scarcely over one-third tibia. Fore wing rather elongate, the termen not specially long or oblique; fovea slight; cell-mark small, the accompanying dark scaling inclined to form a longitudinal dash distally; general coloration warm-buff, with ochraceous-tawny suffusions, some dark irroration and dark cloudings; very variable, possibly embracing two species which are not yet distinguished by the genitalia, in the typical form with only the normal markings of the genus, the distal cloudings moderate, in an aberration with a very heavy cloud or band between median and postmedian, confluent with a distal one. Hind wing with termen crenulate. Underside suffused in the ♂ ♂, sharply marked in the ♀ ♀, the termen of the hind wing in them being whitish except between the radials (in the most strongly marked ♂ ♂ approximating to this); cell-marks moderately large though not intense.

♂ valve very distinct from those of its neighbours in having the process from the thickened proximal part of the sacculus developed into a long stout spine. When this is viewed from the position which best shows the shape of the valve, the extreme tip of this spine exactly covers the proximal end of a narrow scobinate rim which has of course no connection with it.

Habitat.—Fiji.

38. *Cleora munditibia* Prout (pl. vii, fig. 35).

Cleora munditibia Prout, *Nov. Zool.* xxv, p. 71 (1929) (Fiji).

"*Alcis vitensis* ab." B.-Bakr., *Proc. Zool. Soc. Lond.* 1905, p. 94 (1905) (Fiji).

Very similar to *nausori*. Hind tibia in both sexes pale, without the smoky mottlings which are always conspicuous in that species. Hind tarsus almost half hind tibia. Colouring less tinged with ochreous; the white cell-marks, especially on fore wing, more diffuse, less clearly expressed, without such sharp blackish dashes distally; lines not accompanied by conspicuous band-like shades; antemedian of fore wing more strongly excurved in cell, subterminal with the distal maculation at the radials weaker, not (as in *nausori*) spreading forward to SC⁵. Underside with less cloudings than in *nausori* but—at least on hind wing—with more definite demarcation between the dusky submarginal shading and the nearly clear marginal band.

♂ valve curiously similar to that of *tongaica*, but with an additional strongly sclerotic "rose-thorn" on the sacculus well distal to the other processes.

Larva—if I have correctly determined some dwarfed ♀♀ bred at Labasa by W. Greenwood—on leaves of *Macuna aterrima* Holland.

Habitat.—Fiji, distributed.

GEOGRAPHICAL DISTRIBUTION OF THE GROUP.

Section A is distributed from India and Ceylon to the Riu-kiu Islands, Philippines, Bismarcks and Queensland, probably almost everywhere within the limit thus indicated, unless on a few of the smallest islands; sea level to 7,300 feet if not beyond. Section B almost everywhere from West Africa to Polynesia, possibly with transitions to the *C. panagrata* (Walk. 1862) of New Zealand. On account of the wider range of this latter section, it would at first sight seem natural to regard it as more ancestral; on the other hand, it must not be forgotten that it is Section A that is difficult to separate from the Holarctic *Cleora* (sens. str.), and until we have fuller data, zoogeographical and morphological, concerning the group and its outliers, it can only be said definitely that the whole represents an extremely widely-distributed old-world stirps, while the probabilities remain that in a general sense Section A presents a more primitive type of antenna than Section B.

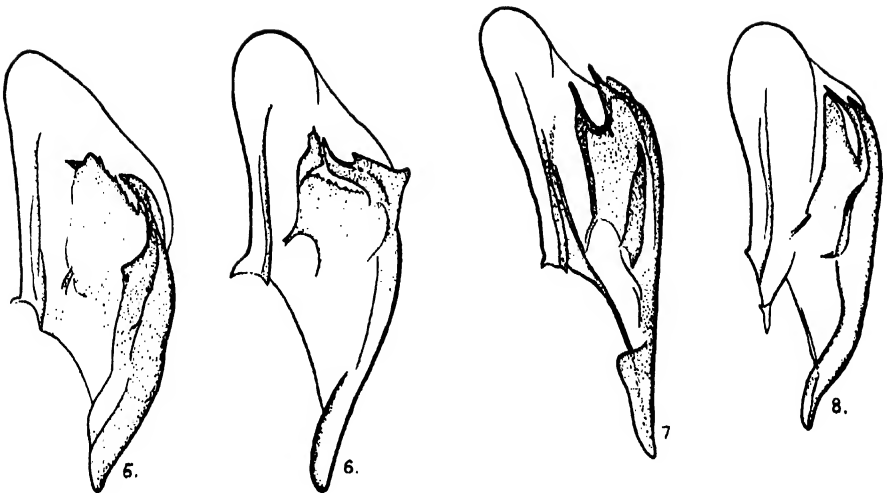
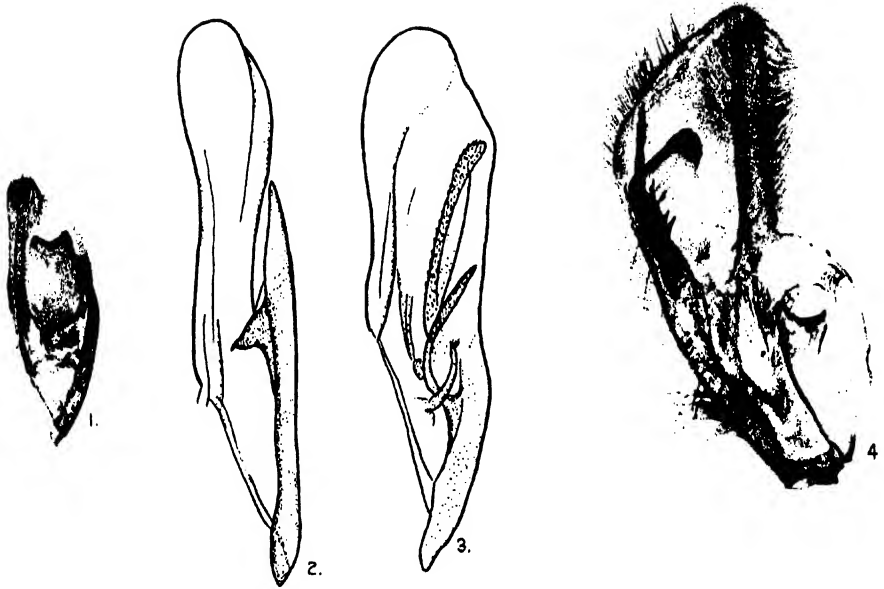
Despite the many lacunae, it will be of assistance to students of local faunae to give a census of species for the principal countries and islands, so far as hitherto known. Details of range and of possibly geographical variation must be sought under the headings of the individual species.

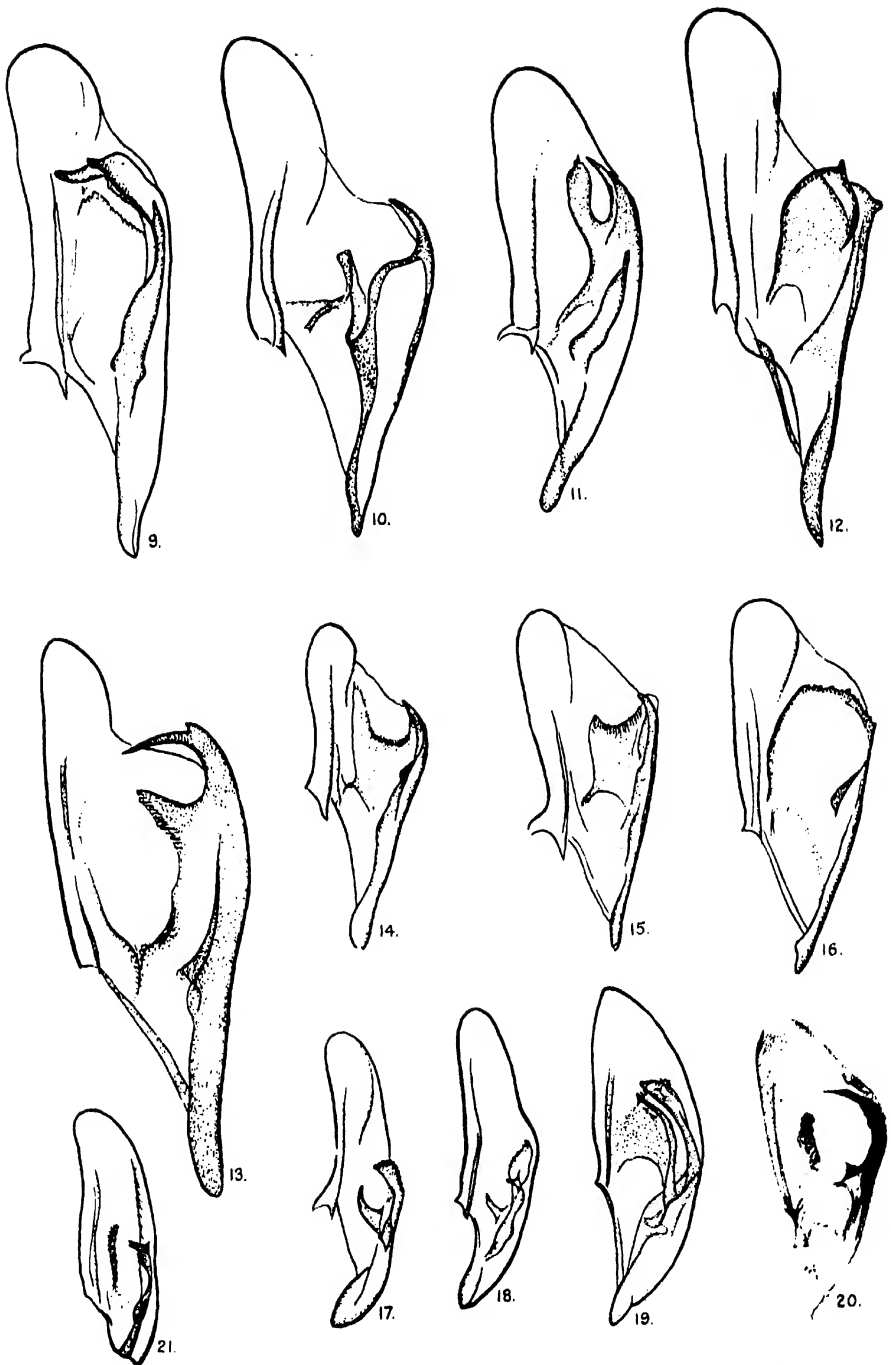
- Amboina.**—*repetita* (No. 1), ? *decisaria* (No. 23). 2 spp.
- Andaman Is.**—*alienaria* (No. 4), *injectaria* (No. 28). 2 spp.
- Aru Is.**—*illustraria* (No. 12), *injectaria* (No. 28). 2 spp.
- Australia.**—*decisaria* (No. 23), *displicata* (No. 21), *godeffroyi* (No. 33), *illustraria* (No. 12), *injectaria* (No. 28), *perlepidaria* (No. 19), *repetita* (No. 1). 7 spp.
- Banda Is.**—*repetita* (No. 1). 1 sp.
- Biak.**—*repetita* (No. 1). 1 sp.
- Bismarck Is.**—*decisaria* (No. 23), *illustraria* (No. 12), *perlepidaria* (No. 19), *repetita* (No. 1). 4 spp.
- Borneo.**—*alienaria* (No. 4), *decisaria* (No. 23), *determinata* (No. 14), *injectaria* (No. 28), *njöbergi* (No. 2), *pendleburyi* (No. 11), *repetita* (No. 1). 7 spp.
- Burma.**—*alienaria* (No. 4), *fraterna* (No. 5), *injectaria* (No. 28). 3 spp.
- Buru.**—*apista* (No. 13), *decisaria* (No. 28), *repetita* (No. 1), *sevocata* (No. 8), *subbarbara* (No. 16). 5 spp.
- Caroline Is.**—? sp. n. (1 ♀, coll. Oberthür, see under No. 33). 1 sp.
- Celebes.**—*decisaria* (No. 23), *concentraria* (No. 27), *injectaria* (No. 28), *repetita* (No. 1). 4 spp.
- Ceram.**—*apista* (No. 13), *decisaria* (No. 23), *meceoscia* (No. 17), *repetita* (No. 1), *sevocata* (No. 8), *subbarbara* (No. 16). 6 spp.
- Ceylon.**—*alienaria* (No. 4), *injectaria* (No. 28). 2 spp.
- China (South).**—? *injectaria* (No. 28), *rhadia* (No. 22). 2 spp.
- Christmas I.**—*alienaria* (No. 4). 1 sp.
- Dammer I.**—*decisaria* (No. 23). 1 sp.
- D'Entrecasteaux Is.**—*decisaria* (No. 23), *hospita* (No. 9), *illustraria* (No. 12), *perlepidaria* (No. 19), *repetita* (No. 1). 5 spp.
- Engano.**—*injectaria* (No. 28). 1 sp.
- Fiji.**—*injectaria* (No. 28), *munditibia* (No. 38), *nausori* (No. 37), *vitensis* (No. 35). 4 spp.
- Formosa.**—*alienaria* (No. 4), *fraterna* (No. 5). 2 spp.
- Friendly Is.**—*samoana* (No. 29), *tongaica* (No. 34). 2 spp.
- Hainan.**—*alienaria* (No. 4). 1 sp.
- Halmahera.**—? ? *concentraria* (No. 27). 1 sp.
- India.**—*alienaria* (No. 4), ? *determinata* (No. 14), *fraterna* (No. 5), *injectaria* (No. 28). 4 spp.
- Java.**—*alienaria* (No. 4), *concentraria* (No. 27), *decisaria* (No. 23), ? *displicata* (No. 21), *hermaea* (No. 7). 5 spp.
- Key Is.**—*decisaria* (No. 23), *repetita* (No. 1). 2 spp.
- Lombok.**—*concentraria* (No. 27). 1 sp.
- Louisianades.**—*decisaria* (No. 23), *injectaria* (No. 28), *repetita* (No. 1). 3 spp.

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- Loyalty Is.**—*decisaria* (No. 23), *immemorata* (No. 26). 2 spp.
- Malaya.**—? *decisaria* (No. 23), *alienaria* (No. 4), *determinata* (No. 14), *injectaria* (No. 28), *pendleburyi* (No. 11). 5 spp.
- Marquesas Is.**—*collenettei* (No. 30), *esoterica* (No. 31). 2 spp.
- Mentawai Is.**—*injectaria* (No. 28). 1 sp.
- New Caledonia.**—*immemorata* (No. 26). 1 sp.
- New Guinea.**—*compectinata* (No. 20), *decisaria* (No. 23), *displicata* (No. 21), *hospita* (No. 9), *illustraria* (No. 12), *perlepidaria* (No. 19), *repetita* (No. 1). 7 spp.
- New Hebrides.**—*hemiopa* (No. 24), *psychastis* (No. 15), *cheesmanae* (No. 36). 3 spp.
- Nias.**—*concentraria* (No. 27), *repetita* (No. 1). 2 spp.
- Philippines.**—*alienaria* (No. 4), *decisaria* (No. 23), *determinata* (No. 14), ? *injectaria* (No. 28), *lipotera* (No. 3), *repetita* (No. 1), *rhadia* (No. 22), *tella* (No. 15). 8 spp.
- Pura I.**—*alienaria* (No. 4). 1 sp.
- Riu-kiu Is.**—*minutaria* (No. 6). 1 sp.
- Sambawa.**—*alienaria* (No. 4). 1 sp.
- Samoa.**—*hemiopa* (No. 24), *samoana* (No. 29). 2 spp.
- Siam.**—*alienaria* (No. 4), *decisaria* (No. 23). 2 spp.
- Society Is.**—*myrmidonaria* (No. 32). 1 sp.
- Solomon Is.**—*decisaria* (No. 23), *illustraria* (No. 12), *repetita* (No. 1). 3 spp.
- Sumatra.**—*alienaria* (No. 4), *concentraria* (No. 27), *decisaria* (No. 23), *determinata* (No. 14), *hermaea* (No. 7), *mecistoscia* (No. 16), *pendleburyi* (No. 11), *xanthorrhages* (No. 10). 8 spp.
- Sumba.**—*decisaria* (No. 23), ? *displicata* (No. 21). 2 spp.
- Talaut.**—*repetita* (No. 1). 1 sp.
- Tenimber Is.**—*decisaria* (No. 23), *injectaria* (No. 28). 2 spp.
- Teoor.**—*repetita* (No. 1). 1 sp.
- Timor.**—*alienaria* (No. 4), *decisaria* (No. 23). 2 spp.
- Tonkin.**—*fraterna* (No. 5). 1 sp.
- Trobriand Is.**—*repetita* (No. 1). 1 sp.
- Waigau.**—*decisaria* (No. 23), *repetita* (No. 1). 2 spp.
- Woodlark.**—*repetita* (No. 1). 1 sp.

Note.—If *Cerotricha licornaria* Guen. should be treated as an outlier of this group (cf. *Ins. Samoa* iii, p. 154), the Society Islands should be credited with two species; but the genitalia are about as inconclusive as the other characters. And if the curious *Aegitrichus lanaris* Butl. may be added (as suggested on p. 155 of the same memoir), Fiji has yet a fifth species.





EXPLANATION OF PLATES V—VII.

Genitalia of the Geometrid genus *Cleora*.

The Valve.

PLATE V.

				PAGE
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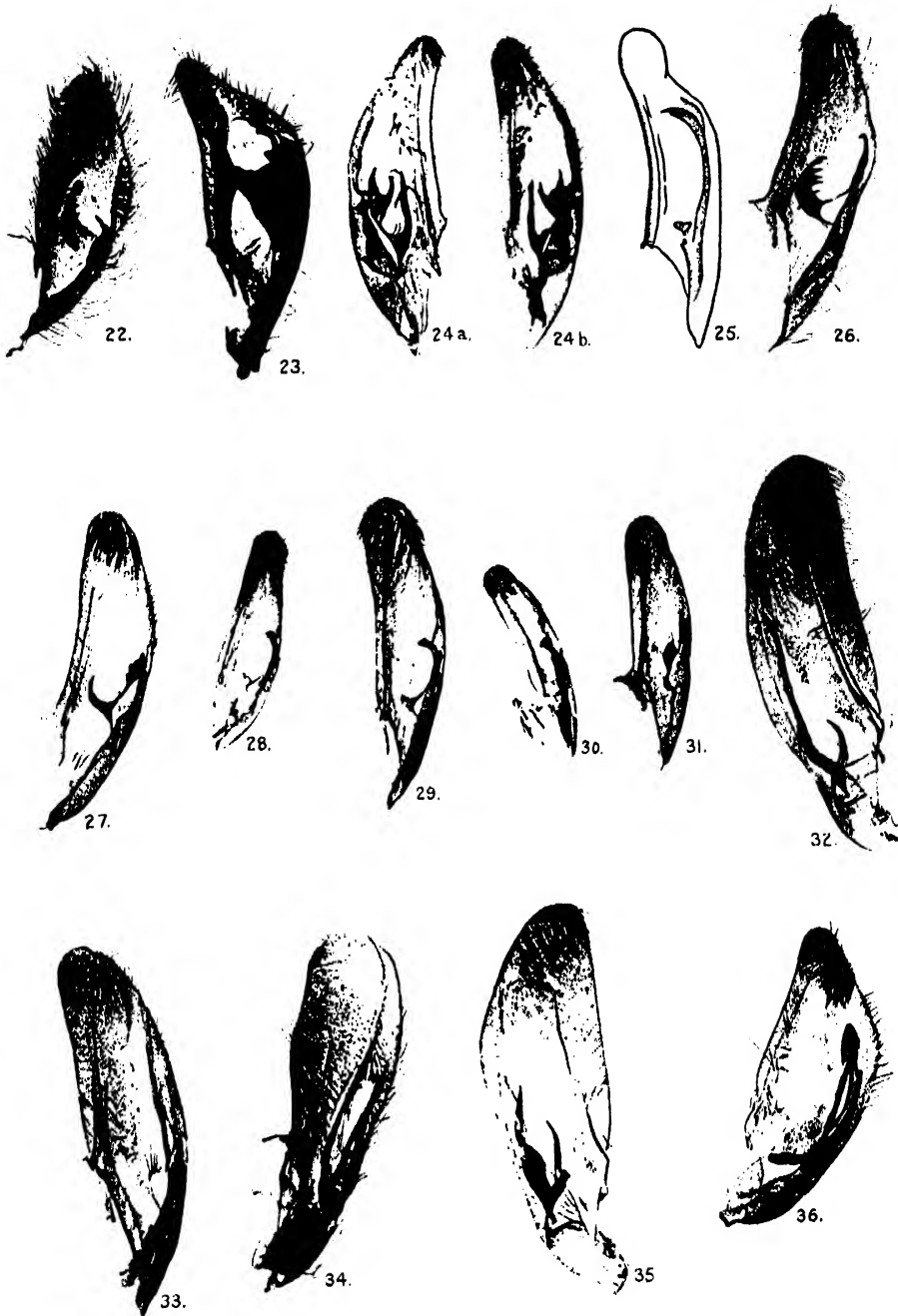
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RHOPALOCERA COLLECTED IN THE REGION OF THE HAUTE VOLTA, FRENCH WEST AFRICA.

PIERIDAE.

By G. TALBOT.

THE species enumerated in the two articles here published formed part of a large collection made by Madame and Monsieur Olsoufieff during 1927—1928. The majority of butterflies obtained in this region occur also in the South Sudan, or are closely allied to Sudan forms; the remainder belong to West African types.

The specimens were all taken in the district of Poundou. Types of new forms are in the Hill Museum.

1. *Herpaenia lacteipennis* Butl. (1876).

A series in November, December, and March. All show a more or less distinct cell-streak on the fore wing, heavily marked in most specimens.

2. *Mylothris chloris* Fabr. (1775).

A series taken in February and from August to October.

3. *Anapheis mesentina* Cram. (1780).

A series in October, November, December, and in February (1 ♀). A ♂ taken in October belongs to the form *auriginea* Butl. A dwarf ♂ taken in November only measures 17 mm. along the fore wing.

4. *Anapheis creona* Cram. (1776).

A series of both sexes August to January, and 1 ♀ in April. The size of the fore wing discal spots is variable in both sexes, as also the colour of the hind wing underside, assuming an ochre-yellow colour in some females.

Two forms of female occur. The typical one has a chalky ground-colour above. The other is coloured like the ♂ with the hind wing

more yellow above and strongly yellow below. Both occur in the same month, and the April one belongs to the second form.

5. *Anapheis gidica gidica* Godt. (1819).

There has been some misconception as to the true habitat and identity of this form. Although Aurivillius (Seitz' *Macrolep.* xiii, p. 40) gives a correct description, he gives "Cape Colony" as the habitat. He probably followed Butler (*Trans. Ent. Soc. Lond.* 1898, p. 436). Boisduval (1836) gives Senegal, and this was most probably the locality of the type, although Grimshaw, who figures the type (*Trans. Ent. Soc. Edinb.* xxix, pt. i, p. 6, pl. fig. 4, 1897) does not give the locality. The Poundou specimens agree very well with Grimshaw's figure. The type specimen was examined by Rowland Trimen, who made some notes in his interleaved copy of *South African Butterflies* now in the Hill Museum library.

He says the specimen is "Certainly a ♂ of the wet season form, and probably an extreme example of that form, as it has the underside of the hind wing unusually white, with the dark markings reduced in number and restricted to the submarginal area. (The apex of one fore wing in this example has been patched with an apex of *Pieris severina*!). In the British Museum collection I examined 2 ♂♂, much like the ♂ above noted, having the underside of the hind wing white, with the black subbasal and central markings wanting (except the terminal discocellular lunule which is enlarged). These two examples are ticketed "Cape of Good Hope (Druce Collection)"; but I have never seen any South African specimens like them, and suspect that they, as well as Godart's type, may perhaps have come from Senegal."

The specimens now before us show that Trimen was right in excluding true *gidica* from the South African fauna. Although the district of the Haute Volta is a dry one, all the ♂♂ are similar and indicate a wet-season form which probably originated in the costal rain-forest area. The dry season form was only present in 2 ♀♀.

There is some variation in the size of the white submarginal spots on the fore wing, and in the width of the black margin of the hind wing in the ♂. The ♀ is more variable, and Aurivillius (l.c.) says it is unknown to him. He recorded it, however, in 1905 (*Arch. Zool.* ii, No. 12, p. 18) from Yola on the Benue River. Boisduval (*Spéc. Gén.* i, p. 503, 1836) also mentions the ♀, but like Aurivillius he gave no detailed description. He compared both sexes with *calypso*, so it may

be inferred that the ♀ he had before him belonged to the form with broad black margins, and this we shall take as the typical form of ♀.

♀ f. *gidica* Godt.—Upperside of fore wing with usually a broader black margin than in *westwoodi* Wlfg., and costal bar narrower. Hind wing with a broader black margin than in *westwoodi*, its edge sharply defined and unbroken. Ground-colour usually chalky-white, some specimens tinged with yellow. Underside with much blacker margins than in *westwoodi*. Hind wing without vein-stripes or other proximal markings except a sharply-marked discocellular bar; proximal area more or less tinged with yellow.

♀ f. *albata* nov.—This form is coloured like the ♂, but with the broad borders of the typical ♀. Fore wing with very narrow black costal edge over the area which is grey in the ♂. One specimen, November.

♀ f. *arida* nov.—Resembles above some specimens of *abyssinica* Luc., but the hind wing border more heavily marked than is usual in these. Underside with brown margins. Hind wing with proximal grey-brown suffusion, more marked in the type than in the other, leaving a longitudinal white stripe of ground-colour which is less prominent than in *abyssinica*. One specimen in March (type), and one in November.

The collection contained a good series of ♂♂ and a short series of ♀♀ obtained from July to December, and in April. Most specimens were apparently caught in November.

In the Hill Museum is a ♂ from Jebba, Niger River, May, taken by Dr. C. Christy. There is also a form from the Gold Coast and one from the Sudan which may belong to other races.

6. *Belenois subeida zoraida* Gaede (1915).

Int. Ent. Zeit. 9, p. 71.

This form was described as a distinct species but it is obviously the northern race of *subeida* Feld. The ♂ was described from the Cameroons, and Aurivillius (*Archiv f. Zool.* 10, p. 6, 1916) described the ♀ from the Sudan. Typical specimens of ♂ *zoraida* from the Wau River and Sudan only differ from the Volta ones in the hind wing below being creamy-yellow instead of white, and females from both regions are identical.

The race is easily distinguished by the complete absence of vein-streaks on the hind wing below. Whether the entirely white ground-colour of the hind wing underside in Volta specimens will not be found

in Sudan ones is uncertain as sufficient material is lacking, but as the females are similar both forms will probably be found in the Sudan.

A series of ♂♂ was obtained from August to November, also 1 ♂ in January, 2 ♀♀ in November, and 1 ♀ in December.

7. *Pinacopteryx venata voltaensis* subsp. nov.

This race agrees with *venata* Butl. (1871) in the form of its scent-scale.

♂. Fore wing more rounded than in *venata*. Hind wing below with black marginal spots which are not produced on the veins, and no postdiscal band of spots, at most three dots in cellules 1c, 2, 3. A discocellular dot as in *venata* and a faint costal streak before the apex. Fore wing without the distal vein-stripes and costal bar seen in *venata*.

A series of ♂♂ was obtained from August to December, and 1 ♂ in January. Type specimen, August—October.

The dry season form of this race we call minor f. nov.

Smaller than the wet form, and with very few scent-scales.

♂. Dark margins of the fore wing brownish-black, black basal dusting reduced. Hind wing with marginal dots which are never prominent and are sometimes obsolete. Underside with obsolete marginal dots, and pale brown apical suffusion on the fore wing and to a less extent over the hind wing, where it is more developed distally. A postdiscal row of small brownish-black spots which may, however, be absent or only partly present.

♀. Resembles *venata* but with a browner tinge. Hind wing on both sides with obsolete marginal dots. Underside as in the ♂ but the brown irroration is more strongly developed especially on the hind wing.

A series of ♂♂ in January and February. Also 3 ♂♂ in November, 10 ♂♂ 1 ♀ in December, and 2 ♀♀ in February.

Types ♂♀ in December.

A ♂ of *venata* in the Hill Museum from the south-east Sudan appears intermediate to *voltaensis*, as the wings are rounded and the spotted band on the hind wing is vestigial. As the veins are black distally, this specimen is best placed with *venata*.

8. *Teracolus amelia* Luc. (1852).

August to October, 1 ♂ 1 ♀; September, 2 ♂♂ 1 ♀; October, 3 ♀♀; November, 3 ♂♂; December, 6 ♂♂ 1 ♀.

This species was kindly determined for us by Mons. F. Le Cerf,

who compared one of this series with the Lucas type in the Paris Museum.

At the same time Mons. Le Cerf determined a specimen of *velleda* Luc. (1852) from the South Sudan. This insect is a distinctly defined race of *amelia* and does not belong to *vesta*. The submarginal spots of both wings and the area lying outside the cell on the fore wing are bright ochraceous as in *aurigineus*. On the contrary *amelia* has the duller ochraceous coloration of *vesta*, with rather small submarginal spots on both wings and minute discal spot on the fore wing.

We are inclined to consider *hanningtoni* Butl. (1883) a separate species, as it is certainly not an *amelia* form. This insect extends from the Victoria Nyanza to Tabora and a race occurs in the Katanga.

A specimen of *velleda* from Toro, and one from Nandi, are in the Hill Museum.

9. *Teracolus celimene sudanicus* Auriv. (1910).

December, 9 ♂♂ 1 ♀; November, 1 ♂.

10. *Teracolus cris* Klug. (1829).

Males, taken in November and December.

11. *Teracolus eupompe* Klug. (1829).

Series of both sexes in November and December, also 1 ♀ in July.

12. *Teracolus achine achine* Cram. (1781), 1 ♀ in July.

Teracolus achine f. *antevippe* Bdv. (1836). Both sexes in November and December.

Teracolus achine f. *ithonus* Butl. (1876). Both sexes in November and December, also 1 ♀ in January, 1 ♂ in March. The males of these specimens have a pink flush below; the females are redder and are speckled. This is the transitional form *luderitzi* Suff. (1904).

13. *Teracolus evippe* L. (1758).

A series of ♂♂ obtained from August to November.

14. *Teracolus antigone antigone* Bdv. (1836).

A series of ♂♂ in November, December, and February; also females in December.

f. *xanthus* Swinh. (1884).

A small series of both sexes in November, December and February.

15. *Teracolus evarne* f. *citreus* Butl. (1876).

Both sexes in November and December. Some specimens not distinguishable from *sharpei* Auriv. (1910).

16. *Catopsilia florella* F. (1775).

A common species in the collection.

17. *Terias brenda* f. *maculata* Auriv. (1910).

A common species in the collection.

18. *Terias briggita* f. *zoe* Hopff. (1855).

A common species in the collection.

LYCAENIDAE.

BY W. HAWKER-SMITH.

No specimens of the subfamily LIPTENINAE were obtained.

1. *Deudorix caerulea* H. H. Drc. (1890). 1 ♂ March.

2. *Deudorix livia* Klug. (1834). 1 ♂ January; 2 ♂ ♂ February; 5 ♂ ♂ March; 6 ♂ ♂ April.

3. *Deudorix antalus* Hpffr. (1855). 5 ♀ ♀ January; 3 ♂ ♂, 1 ♀ February; 1 ♂, 1 ♀ March.

4. *Myrina silenus* Fab. (1775). 6 ♂ ♂ February; 3 ♂ ♂, 2 ♀ ♀ March.

5. *Myrina subnornata* Lathy. (1903). 1 ♂ February.

6. *Hypolycaena philippus* Fab. (1793). 1 ♂ December; 4 ♂ ♂, 3 ♀ ♀ January; 9 ♂ ♂, 1 ♀ February; 1 ♀ March.

7. *Stugeta marmorea* Btl. (1866). 1 ♀ January; 4 ♂ ♂, 6 ♀ ♀ February; 16 ♂ ♂, 8 ♀ ♀ March; 1 ♂, 1 ♀ April; 1 ♂ June; 1 ♀ August—October.

8. *Argiolaus menas* H. H. Drc. (1890). 1 ♂, 1 ♀ February; 2 ♂ ♂ March; 1 ♀ November.

9. *Argiolaus ismenias* Klug. (1834). 1 ♂ November; 1 ♀ December; 1 ♂, 1 ♀ January; 2 ♂ ♂, 1 ♀ February; 15 ♂ ♂, 4 ♀ ♀ March; 1 ♂, 1 ♀ April.

10. *Epamera bicaudatus?* Auriv. (1905). 1 ♂, 1 ♀ February; 5 ♀ ♀ March.

The specimens agree mainly with Aurivillius' figure and description (*Archiv f. Zool.* 2, 12, p. 14, t. 3, f. 3 (1905) in the appearance and position of the spots, but show faint submarginal and postdiscal lunulate lines on the underside; these lines are almost absent in one ♀. Aurivillius' figure suggests an extreme form with the lines absent, but the description mentions two fine dark not very clear submarginal lines. The type came from Alhadji-Bara, a low sandstone hill two or three days' march from Yola, North Nigeria.

11. *Spindasis avriko* Karsch. (1893). 1 ♂ January; 5 ♂ ♂ February; 2 ♀ ♀ March.

12. *Spindasis kaduglii* B.-Bkr. (1916). 3 ♂ ♂, 4 ♀ ♀ February; 14 ♂ ♂, 7 ♀ ♀ March; 1 ♂ April; 3 ♂ ♂ August—October.

13. *Spindasis subaurea* Gr.-Sm. (1898). f. *sabulosa* f. nov.

1 ♂ January; 1 ♂, 1 ♀ February; 1 ♀ March.

Upperside: Resembling *S. subaurea* Gr.-Sm. (1898) in the dark postmedian band crossing the end of the cell on the fore wing being straight, not broken at vein 4 as in *kaduglii* B.-Bkr. Differing from *subaurea* in the light markings of the fore wing being entirely sand-colour instead of whitish.

Underside: Ground-colour sand-coloured, paler in the ♀. Markings as in *subaurea* but fainter. In the ♂, the markings on the hind wings are obsolescent. The ground-colour and markings generally suggest an extreme dry form of *subaurea*.

Length of fore wing: ♂ 16 mm., ♀ 17 mm.

Habitat.—Poundou, Hte. Volta, F. West Africa (G. d'Olsoufieff). Types ♂ H.T. January, ♀ A.T. March, 1928.

14. *Zeritis nerione* Bsd. (1836). 3 ♂ ♂ November; 1 ♂ February; 1 ♀ March.

15. *Axiocerses harpax* Fab. (1775). 1 ♂ November; 13 ♂ ♂, 19 ♀ ♀ January; 29 ♂ ♂, 18 ♀ ♀ February; 4 ♂ ♂, 1 ♀ March.

16. *Axiocerses harpax perion* Cram. (1731). 1 ♂ January; 1 ♂ February.

17. *Axiocerses mendeche* Gr.-Sm. (1905). 2 ♀ ♀ August—October; 3 ♂ ♂, 2 ♀ ♀ November; 2 ♂ ♂, 5 ♀ ♀ January; 21 ♂ ♂, 13 ♀ ♀ February; 2 ♂ ♂ March.

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18. *Lycaenesthes amarah* Guen. (1847). 1 ♂ December; 3 ♂ ♂, 1 ♀ January; 5 ♂ ♂, 2 ♀ ♀ February.
19. *Lycaenesthes lunulata* Trim. (1894). 1 ♂ August—October; 13 ♂ ♂, 1 ♀ January; 11 ♂ ♂, 1 ♀ February.
20. *Lycaenesthes princeps* Btl. (1910). 1 ♂, 1 ♀ December; 2 ♂ ♂ January; 1 ♂ February.
21. *Lycaenesthes crawshayi* Btl. (1910). 8 ♂ ♂ January; 10 ♂ ♂ February.
22. *Triclema marshalli* B.-Bkr. (1903). 1 ♂ January.
23. *Tarucus theophrastus* Fab. (1793). 1 ♂ August—October; 1 ♂, 1 ♀ November; 4 ♂ ♂, 1 ♀ December; 8 ♂ ♂, 2 ♀ ♀ January; 4 ♂ ♂ February.
24. *Tarucus mediterraneae* B.-Bkr. (1917). 1 ♂ August—October; 1 ♂ October; 1 ♂ November; 7 ♂ ♂ December; 12 ♂ ♂, 1 ♀ January; 3 ♂ ♂ February.
25. *Castalius cretosus* Btl. (1876). 2 ♂ ♂ August—October; 9 ♂ ♂ December; 22 ♂ ♂ January; 2 ♂ ♂ February; 2 ♂ ♂ March.
26. *Azanus mirza* Plötz. (1880). 2 ♂ ♂ January.
27. *Azanus ubaldus* Cram. (1782). 8 ♂ ♂ December; 11 ♂ ♂ January.
28. *Syntarucus telicamus plinius* Fab. (1793). 1 ♂ August—October; 2 ♂ ♂, 1 ♀ November; 2 ♂ ♂ December; 6 ♂ ♂ January.
29. *Nacaduba sichela* Wallgr. (1857). 2 ♂ ♂ December; 2 ♂ ♂ January.
30. *Lampides boeticus* Linn. (1767). 1 ♀ December; 2 ♂ ♂, 1 ♀ January.
31. *Euchrysops reducta*, Hulstaert (1924). 1 ♂.
32. *Euchrysops malathana* Bdv. (1833). 1 ♂, 1 ♀ August—October; 2 ♂ ♂, 1 ♀ December; 13 ♂ ♂, 5 ♀ ♀ January; 2 ♂ ♂ February; 1 ♂ March.
33. *Euchrysops malathana nilotica* Auriv. (1904). 2 ♂ ♂ December; 17 ♂ ♂ January.

34. *Euchrysops osiris* Hopff. (1855). 2 ♂♂ November; 5 ♂♂, 1 ♀ December; 9 ♂♂, 3 ♀♀ January; 1 ♂ February.

35. *Chilades trochilus* Frey (1844). 1 ♂, 2 ♀♀ August—October; 1 ab. uncertain October; 1 ♀ January; 2 ♂♂ March.

36. *Neolycaena cissus* Godt. (1819). 2 ♂♂ February.

37. *Plebeius nigeriae* E. Shpe. (1903). 1 ♂ August-October; 118 ♂♂, 13 ♀♀ December; 77 ♂♂, 7 ♀♀ January; 2 ♂♂, 3 ♀♀ February.

38. *Zizina antanossa* Mab. (1877). 1 ♂ December; 2 ♂♂, 1 ♀ January.

39. *Zizeeria lysimon* Hbn. (1798). 1 ♂ December; 2 ♂♂, 1 ♀ January.

Note.—*Aphnaeus ruficaudis* Strand, *Nachtrage zu Lep. Niepeltiana*, p. 2, Taf. xviii, ff. 9, 10 (September, 1918).

I should like to call attention to the fact that in the Hill Museum there are three specimens labelled *Aphnaeus ruficaudis* Strand, the type H.T. and two cotypes received from Niepelt, which are none other than *Spindasis aderna* Plötz. 1880. These specimens bear labels: "Salomon Archipel. Bougainville"!!

A NEW SPECIES OF AFRICAN LYCAENIDAE
(LEP. RHOP.).

BY W. HAWKER-SMITH, F.E.S.

Oxylides gloveri sp. nov.

PROBABLY nearest to *O. bella* Auriv. but differs in the much greater extent of the blue on the fore wing.

♂ Upperside: Fore wing rather lighter blue than in *bella*, the blue colour extending to within 3 mm. of the apex. The black margin narrows to a point at the tornus. The proximal half of the costa is very narrowly black. Hind wing practically similar to *bella* but the apical black is narrower.

Underside: Fore wing white, the slight blackish apical suffusion occurring in some specimens of *bella* is more pronounced, the discal transverse band is more broadly bordered with black giving it a darker appearance, and the submarginal black line is broader, almost obliterating the yellow marginal line. The fringe is black tipped with pale grey. Hind wing as in *bella* but the ante-marginal band from near the apex to the middle of area 4 is black instead of yellow edged with black.

Length of fore wing, 15.5 mm.

Habitat.—Sanga River, Nola-Byanga, French Congo (T. A. Glover).

The description is from a ♂ specimen which has unfortunately lost its abdomen.

Type in Hill Museum.

A REVISION OF THE GENUS *PHYCIODES* Hübn.
(*Lepidoptera Nymphalidae*).

By ARTHUR HALL, F.E.S.

(*Supplement to THE BULLETIN OF THE HILL MUSEUM, Vol. III.*)

(*Continued from p. 146.*)

88. *P. nauplia* Linn.

Pap. nauplia Linn., *Syst. Nat.* i, p. 448 (1758); Clerck, *Icones* t. 46, f. 2 (1764); Cram., *Pap. Ex.* iv, t. 316, f. D, E (1782); *Nymph nauplia* Godt. *Enc. Méth.* ix, p. 433, n. 264 (1823); *Eresia nauplia* Bates, *Journ. Ent.* ii, p. 192 (1864); Druce, *Proc. Zool. Soc.* 1876, p. 222; *Phyc. nauplia* Rüb. in Seitz' *Macrolep.* v, p. 446 (1913).

= *Eresia clara* Seitz (non Bates) l.c. t. 92, f. H5 (1913).

(a) *P. nauplia plagiata* Rüb. in Seitz l.c. p. 446 (1913).

= *Eresia nauplia* Seitz l.c. t. 92, f. H3 (1913).

(b) *P. nauplia extensa* subsp. nov.

P. nauplia nauplia Linn.

Exp. 40—50 mm.

♂. Closely allied to *P. clio* Linn. but fore wing more produced; markings always pure white. Upperside, fore wing cell-spot distinct, sometimes dusted with fuscous; discal patch formed of spots in cellules 2—3 as in *P. clio* but more often extended into 1b; a small subcostal spot in 4 as well as those in 5 and 6; a quadrate postdiscal spot in 4, often with a smaller one above it; a small submarginal spot in 4. Hind wing median band about 3 mm. wide; a more or less indistinct tawny postdiscal stripe; submarginal line generally obscured with fuscous, the spot at anterior angle not enlarged.

Underside differs from white examples of *P. clio* in the fore wing having a distinct fulvous spot just beyond apex of cell, in the space between the two subbasal black stripes of hind wing being partly or wholly fulvous, the fulvous postdiscal band being continued to costa, and in the silvery-white submarginal spots being larger and more distinct, the series complete.

♀. Similar to ♂ except that fore wings are a little more rounded and generally have the postdiscal spot in 5 as well developed as that in 4.

Habitat.—Surinam: Berg-en-daal; French Guiana: St. Jean du Maroni, St. Laurent du Maroni; British Guiana: Berbice, Demerara River; Lower Amazon: Para, Santarem, Obydos, Itaituba, Manicoré, Rio Madeira, Rio Purus.

Dated specimens January, July, September, October, December.

Bates states that *P. nauplia* and *P. clio* nearly always occur together and in about equal numbers, but this is not borne out by my experience on the Lower Amazon where, between January and April, I took large

numbers of *P. clio* but no *P. nauplia* at all. The latter, however, appears to be very common in some seasons. Specimens from the Rio Madeira are intermediate between *P. nauplia nauplia* and the following race.

(a) *P. nauplia plagiata* Rüb.

♂. Fore wing broader than in *P. nauplia nauplia*; cell-spot and discal patch in 2—3 larger, often contiguous; subcostal spots 4—6 larger, often more or less confluent with the postdiscal spots in 4—5 and, on the underside, also with the submarginal spot in 4, thus forming a broad subapical band; basal stripe in cell beneath wholly white. Hind wing without traces of tawny postdiscal stripe above; whitish submarginal line more distinct and even.

♀. Similar to ♂ except that fore wings are shorter and subcostal spots 4—6 less inclined to coalesce with the postdiscal spots.

Habitat.—Upper Amazon: Upper Madre de Dios (type), Tefé, Jibuty, Rio Jurua, Pebas, Nauta, Iquitos; Peru: Rio Ucayali, Rio Chuchurras, Chanchamayo; Ecuador: Coca and Suni on the Rio Napo.

Dated specimens April, May, July, September, October, November.

Recalls *Vila caccilia* Feld. and several species of *Ithomiinae* from the same districts.

(b) *P. nauplia extensa* subsp. nov.

♂, ♀. Upperside with white markings larger and more sharply defined than in *nauplia nauplia* or *nauplia plagiata*; subcostal spots 4—6 of fore wing not confluent with the postdiscal spots; band of hind wing nearly half as wide again as in *nauplia nauplia* or *nauplia plagiata*, its distal edge straight, not concave; no trace of the tawny postdiscal stripe above.

Habitat.—Brazil: Chapada and Cuyaba in Matto Grosso.

Type ♂, allotype ♂ and four ♂ ♂ paratypes in the British Museum.

In the male armature of *P. nauplia* I have been unable to detect any differences from *P. clio*.

89. *P. letitia* Hew.

Eresia letitia Hew., *Equat. Lep.* p. 24 (1869); *ibid.*, *Ex. Butt.* lv, *Eresia*, t. 9, f. 70, 75, ♂, 76, ♀ (1870); Seitz' *Macrolep.* v, t. 91, f. A3, ♂ (1913); *Phyc. letitia* Rüb. in Seitz, l.c. p. 448 (1913).

= *E. leucophaea* ♂, Weyman in Stübels' *Reise*, p. 54 (1890).

= *P. leucophaea*, Seitz' *Macrolep.* v, t. 90, f. H4, ♀ (1913).

(a) *E. leucophaea* ♀ Weym. in Stübels' *Reise*, p. 54 (1890).

(b) *E. letitia nigra*, Rosenb. and Talbot, *Trans. Ent. Soc.*, 1913, p. 676, *Nov. Zool.* xxx, pl. iv, fig. 11 (1923).

= *P. leucophaea* Rüb. (non Weym.), in Seitz' *Macrolep.* v, p. 448 (1913); *Eresia leucophaea*, Seitz l.c. t. 91, f. A4 ♂ (1913).

(c) *P. letitia nigra* ♀ *f. leucophaeoides* form. nov.

P. letitia letitia Hew.

Exp. ♂ 44—50, ♀ 54—58 mm.

♂. Upperside black; markings white. Fore wing with basal stripe in the cell strongly dusted with fuscous and sometimes with faint indications of a fuscous bar at the middle; a large discal spot in 2, a narrower one above it in 3, and three small subcostal spots in 4—6, that in 4 often a mere dot; a round postdiscal spot in 2, often with a smaller one below it in 1b, and three others in 4—6, that in 4 the largest, the others less sharply defined; a well-marked submarginal spot in 4, and smaller ones, often more or less obscured, in 3, 6, 7 and 8.

Hind wing with white median band 3—4 mm. wide, entire and sharply defined; a submarginal series of thin lunules, the one at anterior angle represented by a distinctly larger spot.

Underside: Fore wing white spots all much larger than above, especially postdiscal spots 4—6, which form a large circular patch; basal stripe not dusted with fuscous; a light rufous-brown costal stripe, interrupted at middle and at apex, and a rufous-brown marginal stripe. Hind wing costa rufous-brown beyond middle; base white, separated from median band by a narrow subbasal band of black, changing posteriorly to rufous-brown; white band broader than above, not sharply defined distally; white submarginal spots much larger than above, bordered proximally by a bright rufous-brown postdiscal stripe; a white antemarginal line, cut by the veins.

♀. Larger than ♂, wings broader. Upperside, pattern as in ♂ but all the markings light rufous, sometimes inclining to yellowish. Fore wing basal stripe not dusted fuscous; subcostal spots 4—6 larger; postdiscal spots in 5 and 6 variable, sometimes as large as beneath, sometimes obsolete. Hind wing median band broader, 6—8 mm. wide.

Underside as in the ♂ but all white markings replaced by ochraceous except the antemarginal line and four posterior submarginal spots of hind wing, which often remain white.

Habitat.—Colombia: San Augustin (5,400 feet), Cañon de Tolima, Cauca Valley, Upper Rio Negro; Ecuador: Santa Ines (type in British Museum), Granadillas, Canelos, Baños, Sarayacu, Rio Pastazza (4,200 feet), Aguano.

Dated specimens December and January.

The ♀ of *letitia letitia* occurs in a rufous and a white form, the former being the type. Rufous ♀ ♀ from Colombia have the band of hind wing broader than those from Ecuador, but as I have not seen more than half-a-dozen examples of this sex the difference may not be constant. Colombian ♂ ♂ are typical.

(a) *P. letitia letitia* ♀ f. *leucophaea* Weym.

♀. Markings of both surfaces white; similar in all respects to the ♂ except that the band of hind wing is broader.

Habitat.—Ecuador: Baños.

Weymer took the rufous ♀ for a different species and described white examples of both sexes as *P. leucophaea*, his types being from the neighbourhood of Baños, Ecuador; the latter name can therefore only stand for the white ♀ of *letitia letitia*. Seitz' fig. of *leucophaea* on Plate 90 is a ♀ of *letitia letitia* and that on Plate 91 is a ♂ of the following race.

(b) *P. letitia nigra* Rosenb. and Talb.

♂. Upperside with the white markings more dusted with fuscous than in the same sex of *letitia letitia*; postdiscal spot in 2 of fore wing often centred with blackish scales; distal edge of median band of hind wing much less sharply defined.

Underside: White markings much more greyish than in *letitia letitia*; rufous-brown stripes a little darker, more chestnut-brown.

♀. Upperside with rufous markings rather paler than in the ♀ of *letitia letitia* and more dusted with fuscous; median band of hind wing narrower.

Habitat.—Peru: Huancabamba, La Merced (2,000—3,000 feet), San Remon (3,000 feet), Rio Colorado, Oxypampa (7,200 feet), Chanchamayo, Chachapoyas. Type ♂ from Huancabamba in Tring Museum; neallotype ♀ from Chachapoyas in British Museum.

Dated specimens January, July, August, September.

In some examples of the ♂ the rufous-brown postdiscal band of hind wing is indistinctly marked above. The ♀ also occurs in two

forms, of which the rufous one may be considered typical for the sake of conformity.

(c) *P. letitia nigra* ♀ f. *leucophaeoides* form. nov.

♀. Markings of both surfaces white as in the ♂ but somewhat more greyish; median band of hind wing broader above.

Habitat.—Peru: Chanchamayo. Type ♀ in coll. Hall.

Valve of *P. letitia letitia* ♂ similar to that of *P. clio* L. Uncus sharply contracted near its base, then expanded, the end with a small spinose lobe at each side. Saccus with a single long blunt projection.

90. *P. ocellata* Rüb.

P. letitia subsp. *ocellata* Rüb. in Seitz' *Macrolep.* v, p. 448 (1913).

= *Eresia neptoides* Rosenb. and Talbot, *Trans. Ent. Soc.* 1913, p. 675 (1914); *ibid.*, *Nov. Zool.* xxx, pl. iv, fig. 12 (1923).

Exp. 48—50 mm.

♂. Very similar on both surfaces to *P. letitia nigra* Rosenb. and Talbot. Upperside: Fore wing with white markings dusted with fuscous exactly as in the ♂ of *letitia nigra* but the three submarginal spots at apex pure white and much more sharply defined, the discal spot in 2 a little larger, its outer edge oblique and more definite, the post-discal spot in 2 always centred with blackish scaling, and the small spot below it in 1b much better defined, always present. Hind wing median band distinctly yellowish, only 3 mm. wide, its distal edge not sharply defined, submarginal line, except the two spots at anterior angle, thin and straight, not lunulated.

Underside: Fore wing almost as in *letitia nigra* but the discal spot in 2 extending a little below vein 2, the small postdiscal spot in 1b much clearer, the rufous-brown stripes a little darker, and a small rufous-brown mark on the discocellulars. Hind wing with less whitish scaling at base; submarginal spots, except the two at anterior angle, straight and linear, forming a line scarcely broader than the antemarginal line. Anal tuft of hairs on abdomen white, not rufous as in *P. letitia nigra*.

♀. Unknown.

Habitat.—Peru: El Porvenir (900 m.), San Ramon (3,000 ft.), Chanchamayo.

Dated specimens April and August.

A highly interesting species owing to its extreme similarity to *P. letitia nigra*. The male armature (pl. iii, fig. 32) does not show any essential differences from that of *P. letitia*.

91. *P. perna* Hew.

Eresia perna Hew., *Ex. Butt.* i, *Eresia*, t. i, f. 5, ♂ (1862); Seitz' *Macrolep.* v, t. 92, f. G. 4, 5, ♀ (1913); *Phyc. perna* Rüb. in Seitz l.c. p. 446 (1913).

= *P. alma* Staud., *Ex. Schmett.* i, p. 93, t. 36, ♂ (1888); Rüb. in Seitz' *Macrolep.* v, p. 446 (1913).

(a) *Eresia aveyrona* Bates, *Journ. Ent.* ii, p. 192, t. 10, f. 4, ♀ (1864); Godm. and Salv., *Biol. Cent.-Am. Rhop.* i, p. 185 (1882) *Phyc. aveyrona* Staud., *Ex. Schmett.* i, p. 93 (1888); Rüb. in Seitz' *Macrolep.* v, p. 446; *Eresia aveyrona* Seitz l.c. t. 92, f. D3, ♂ (1913).

(b) *Eresia bella* Hew., *Ex. Butt.* iv, *Eresia*, t. 9, f. 71 (1870); *Phyc. bella* Rüb. in Seitz' *Macrolep.* v, p. 446, t. 88, f. I 2, ♂ (1913).

= *Eresia mylitta* Hew. (non Edw.), *Equat. Lep.* p. 26 (1869).

P. perna perna Hew.

Exp. 45—55 mm.

♂. Upperside black; markings varying from light yellow to pale fulvous. Fore wing a narrow stripe in cell, its basal part sometimes obscure, its outer end often partly separated by a black line; in cellule 2 a large, elongate spot contiguous with the cell-stripe, sometimes extending slightly into 1b and 3; two small, ill-defined subcostal spots in 5 and 6, sometimes followed by a streak on costa; an oblong postdiscal spot in 4, sometimes with a smaller, ill-defined spot above it in 5. Hind wing with straight median band 2—3 mm. wide; sometimes an indistinct tawny postdiscal stripe between inner margin and vein 4.

Underside: Fore wing blackish-brown; base of costa light fulvous; basal stripe pale yellow, broader than above; subcostal spots 5—c also pale yellow, larger and clearer than above; three long postdiscal spots in 4—6, forming a large pale-yellow circular patch; several small white submarginal spots at apex; sometimes a fragment of a fulvous marginal stripe near hinder angle. Hind wing pale yellow; two parallel black subbasal stripes; median band of the ground colour broader than above, limited distally by a black band from inner margin to vein 6; a bright fulvous postdiscal band; outer marginal black with a submarginal series of narrow white lunules, the two at anterior angle broader and less lunular.

♀. Very similar to ♂ but fore wing broader, rounder; subcostal spots 5—c more clearly marked above, and postdiscal spot in 5 as large as that in 4; hind wing tawny postdiscal stripe more distinct. Underside as in ♂.

Habitat.—Brazil: Rio Janeiro (type, in British Museum), Espiritu Santo, Santos, Santa Catharina.

Rather scarce and only found singly. The only dated specimens I have seen were taken in November. The British Museum contains a pair labelled "Chanchamayo," but this is probably an error.

(a) *P. perna aveyrona* Bates.

♂. All markings above reddish-fulvous. Fore wing basal stripe longer and broader than in *P. perna perna*, extending below median vein and vein 2, and nearly reaching outer margin; subcostal spots 5—6 larger; postdiscal spot in 5 as large as that in 4, the two forming a round patch which sometimes extends into 6; hind wing median band broader, about 4 mm. wide; postdiscal band distinct, extending to vein 6.

Underside as in *P. perna perna* except that the basal stripe of fore wing has a more fulvous tinge and is longer.

♀. Similar to ♂ except that the fore wings are broader and that the fulvous postdiscal stripe of hind wing is broader than the black band internal to it, sometimes united at the anterior end with the median band.

Habitat.—French Guiana: Cayenne (coll. Standinger); British Guiana: Barima River (coll. Hall); Lower Amazon: Aveyros on the Tapajoz (type, in Brit. Mus.); Venezuela, Suapure (Mus. Tring); Chiriqui (coll. Brit. Mus.); Costa Rica (coll. Brit. Mus.).

Although widely distributed this form seems extremely scarce where it occurs. I have only seen single examples from each of the localities given above, except Suapure, from which there are three ♂♂, one ♀ in the Tring Museum; these were taken in February and March.

(b) *P. perna bella* Hew.

♂. Fore wing more rounded than in the other subspecies. Upper side: markings fulvous, as in *P. perna aveyrona* except that the subcostal spots of fore wing are fused together with the postdiscal patch so as to form a broad subapical band, sometimes with traces of a black dividing line.

Underside as in *P. perna aveyrona* except that on hind wing the pale space between the two black subbasal lines is narrower than the more distal line.

♀. Like ♂ but fore wing a little broader.

Habitat.—Ecuador: Santa Ines (type in Brit. Mus.), Sarayacu, Curarai.

All the forms of *P. perna* have more or less resemblance to *Eucides lybia* Fabr. and its allies, the ♀ ♀ being better mimics than the ♂ ♂.

Male armature very similar to that of *P. clio*; process at tip of valve very short.

92. *P. lansdorfi* Godt.

Heliconius lansdorfi Godt., *Enc. Méth.* ix, p. 209 (1823); Guerin, *Icon. Regne Anim. Ins.* t. 77, f. 3 (1844); *Phyc. lansdorfi* Staud, *Ex. Schmett.* i, p. 92, t. 36, ♂ (1888); Rüb. in Seitz' *Macrolep.* v, p. 448 (1913); *Eresia lansdorfi* Seitz l.c. t. 92, f. A1, 2 (1913).

= *Melinæa lansdorfi* Geyer, in Hübn. *Zutr. Ex. Schmett.*, f. 389, 390 (1823).

(a) *P. lansdorfi* f. *jacinthica* Rüb. in Seitz' *Macrolep.* v, p. 448, t. 90, f. K6 (1913).

P. lansdorfi lansdorfi Godt.

Exp. 48—58 mm.

♂, ♀. Upperside black. Fore wing a narrow yellowish streak in cell, its anterior end separated into a yellowish or rufous spot; a very broad band of dark red crossing the disc from inner margin to costa, broadest in cellules 2 and 3, where it reaches outer margin, narrowed to about 5—6 mm. above vein 5, where its basal side is generally of a lighter colour, as though superimposed on a paler band. Hind wing with narrow median band of clear sulphur yellow about 2 mm. wide; no postdiscal stripe or submarginal line.

Underside blackish-brown. Fore wing cell-stripe broader than above, wholly yellow; posterior part of discal band dark rufous, sometimes becoming yellow at the base of cellules 2 and 3, anterior part, above vein 4, white, faintly tinged with rufous, distally diffused and ill-defined but extending in the form of streaks to near apex. Hind wing with a yellow stripe on costa; median band as above but continued to anterior angle, where it is sometimes whitish; a dark red postdiscal stripe extending at the most from inner margin to vein 6, sometimes obsolete anteriorly; no submarginal spots.

The ♀ only differs from the ♂ in its slightly broader fore wing.

Habitat.—Brazil: Rio Janeiro, Tijuca, Petropolis (2,000 feet), Theresopolis, Espirito Santo, Minas Geraes, São Paulo, Alta da Serra

Santos, Santa Catharina, Castro and União da Victoria in Parana, Santa Maria and Porto Allegre in Rio Grande do Sul; Paraguay: Sapucay; Argentina: Misiones, Paso de los Libres.

Dated specimens January, February, March, September, October, November, December.

Although a common species, this is one of the most interesting on account of its similarity to *Heliconius phyllis* and *H. besckei*, a resemblance which is more marked on the wing than in the cabinet, as the darker colour of the red band is not then noticeable. In general it varies very little, but the following aberrant form has been named.

(a) *P. lansdorfi* ab. *jacinthica* Rüb.

Differs only in the cell stripe of fore wing above being wholly rufous and broader, and in the dark red postdiscal stripe of hind wing being more or less developed on the upper surface.

Habitat.—Brazil: San Jacintho Valley (type), São Paulo, Espiritu Santo, Petropolis.

All the examples that I have seen of this form are ♀ ♀.

Mr. W. J. Kaye has taken a remarkable example in which the band of the fore wings is almost white above.

Uncus of *P. lansdorfi* of the same general form as in *P. letitia* but the sides less contracted and the end broader. Valve and saccus quite similar.

93. *P. eunice* Hübn.

Nereis fulva eunice Hübn., *Samml. Ex. Schmeltt.* t. 9, f. 1-4 (1806-18); *Eresia eunice* Bates, *Journ. Ent.* ii, p. 191 (1864); *Phyc. eunice* Staud., *Ex. Schmeltt.* i, p. 93 (1888).

= *Eresia pella* Hew., *Ex. Butt.* i, *Eresia*, t. 1, f. 2, ♀ (1852); *Phyc. pella* Rüb. in Seitz' *Macrolep.* v, p. 446 (1913).

= *P. olivencia* Rüb. (non Bates), in Seitz l.c. p. 447 (1913); *Eresia olivencia* Seitz l.c. t. 92, f. A5, B1 (1913).

(a) *Eresia olivencia* Bates, *Journ. Ent.* ii, p. 191 (1864); *Phyc. olivencia* Staud., *Ex. Schmeltt.* i, p. 193 (1888).

= *P. gudruna* Rüb. in Seitz' *Macrolep.* v, p. 447 (1913); *Eresia gudruna* Seitz l.c. t. 92, f. B2 (1913).

(b) *Eresia klagesii* Weeks, *Entom. News*, xvii, p. 195 (1906); *ibid.* Ill. *Diurn. Lep.* ii, p. 1, t. 1, ♂ (1911).

(c) *P. olivencia* f. *brunhilda* Rüb. in Seitz' *Macrolep.* v, p. 447 (1913); *Eresia brunhilda* Seitz l.c. t. 92, f. B3 (1913).

(d) *Eresia esora* Hew., *Ex. Butt.* ii, *Eresia*, t. 2, f. 12 (1857); *Phyc. esora* Rüb. in Seitz' *Macrolep.* v, p. 446 (1913).

= *P. eunice* Rüb. in Seitz l.c. p. 446 (1913); *Eresia eunice* Seitz l.c., t. 92, f. A3, 4 (1913).

(e) *Eresia drypetis* Godm. and Salv., *Proc. Zool. Soc.* 1878, p. 269; *ibid. Biol. Cent.-Am. Rhop.* i, p. 184, t. 20, f. 11, 12 (1882); *Phyc. drypetis* Rüb. in Seitz' *Macrolep.* v, p. 447 (1913).

= *P. polymnia* Rüb. in Seitz l.c. p. 447 (1913).

(f) *Eresia mechanitis* Godm. and Salv., *Proc. Zool. Soc.*, 1878, p. 269; *ibid. Biol. Cent.-Am. Rhop.* i, p. 183, t. 20, f. 13, 14 (1882); *Phyc. mechanitis* Rüb. in Seitz' *Macrolep.* v, p. 447, t. 90, f. H5 (1913).

P. eunice eunice Hübn.

Exp. 45.—55 mm.

♂ Upperside. Fore wing black; a large fulvous basal patch occupying two-thirds of the cell and the greater part of cellule 1b, but divided by a black streak along median vein and the part lying in 1b interrupted by a rather large black spot near hinder angle; a large yellow spot at end of cell and another longer one in 2, these two forming an oblique band contiguous with the basal patch and often fused with it by becoming partly or wholly fulvous; disc crossed from vein 3 to costa by an oblique subapical band of large pale-yellow spots, the spots in 3 and 4 placed more distal, that in 4 often deeply excavated above or abbreviated; sometimes one or two very small yellowish preapical spots. Hind wing fulvous, with three transverse black bands, each about 2 mm. wide; subcostal band generally terminating before anterior angle, seldom joining marginal band; discal band more or less macular, often distinctly divided into spots; marginal band entire, sometimes with faint traces of pale submarginal spots posteriorly. Cilia of both wings distinctly white between veins.

Underside paler than above. Fore wing black stripe on median vein thinner or absent; two or three fairly large yellow preapical spots and a variable number of small yellow submarginal spots, that in 3 the most often present. Hind wing base and space between subcostal and discal bands pale yellow; discal band distinctly divided into well separated spots; marginal band sometimes obsolete anteriorly, always with a submarginal series of white or pale yellowish lunules.

♀ Very similar to ♂ but fore wing a little more rounded, generally with two small yellow preapical spots above; the long yellow spot in cellule 2 often divided into two.

Habitat.—Surinam: Paramaribo; French Guiana: St. Jean du Maroni; British Guiana: Georgetown, Potaro River, Berbice, Quongo; Venezuela: Suapure, San Esteban; Northern Brazil: Montes Aureos in Maranhão; Amazons: Para, Obydos, Santarem, Itaituba, Rio Madeira, Fonteboa, Teffé, Rio Jurua; Ecuador: Rio Napo, Canelos, Zamora; Peru: Pebas, La Merced, Palcazu, Rio Huacamayo, Chanchamayo; Bolivia: Santa Cruz de la Sierra, Reyes, San Agustin Mapiri (3,500 feet), Rio Beni, Rio Juntas.

Dated specimens all months.

P. eunice is one of the commonest and most widely distributed of the mimetic species and is very variable. Typical *eunice eunice* ranges from the Guianas and Maranhão to Peru and Bolivia, so that some interesting forms from the Amazons cannot be regarded as sound subspecies. Nearly all specimens from Guiana and Para may be referred to *eunice eunice*, although there is a certain amount of variation, as, for instance, the form figured by Hewitson as *Eresia pella*, with unusually pale straw-yellow bands. From Santarem up to Chanchamayo, however, we find the greatest instability, and in many places on the Middle and Upper Amazon typical specimens are the exception. An otherwise typical ♀ in the Tring Museum has the black discal and submarginal bands of hind wing confluent, and in other examples the black band between the yellow subapical band and the basal patch of fore wing is interrupted at the median vein.

(a) *P. eunice eunice* f. *olivencia* Bates.

♂, ♀. Fore wing yellow subapical band broad, its posterior end confluent with the basal patch, the black band between them terminating before the middle of cellule 3; black streaks along median vein and on inner margin often obsolete; in some examples the black marginal border of hind wing beneath is inclined to become macular.

Habitat.—Upper Amazon: Teffé, São Paulo da Olivencia (type in British Museum), Pebas, Rio Chachijaca near Iquitos, Rio Jurua.

The form figured in Seitz under the name of *gudruna* is so similar to the type specimen of *olivencia* that it must be regarded as the same thing, but the same author's figs. of *olivencia* represent a form nearer to *eunice eunice* and needing no separate name. In the Tring Museum there is a specimen from Teffé with the pattern of *olivencia* but all the markings of the deep cinnamon-red colour characteristic of so many butterflies of that district.

(b) *P. eunice eunice f. klagesii* Weeks.

♂. General pattern of *eunice eunice* but on upperside all the black markings of fore wing are clouded with fulvous and suffused, and on hind wing the discal black band is represented by very small, widely separated spots.

Habitat.—Venezuela: Suapure. Type in coll. Weeks; two ♂♂ in Tring Museum. Other specimens from the same locality are typical.

(c) *P. eunice eunice f. brunhilda* Rüb.

♂. ♀. Fore wing with black discal band terminating at the middle of the wing as in *f. olivencia*, but the black marginal border only about 2 mm. wide at apex, the preapical area being fulvous, marked with two round black spots in cellules 4 and 5.

Habitat.—Bolivia: San Agustin Mapiri, Saraya; Ecuador: Rio Napo.

Most specimens of this form that I have seen are ♀♀. In some of these the subapical band of fore wing is wholly fulvous, not yellowish.

(d) *P. eunice esora* Hew.

♂. ♀. Fore wing subapical band broader and more regular than in *eunice eunice*, clear pale-yellow, the black band internal to it entire; preapical spots absent. Hind wing with a distinct pale-yellow median band between the subcostal and discal black bands.

Habitat.—Central Brazil: Rio Janeiro, Espiritu Santo, Bahia, Itaparica, São Paulo, Bauru, Theophilo Ottoni in Minas Geraes Chapada in Matto Grosso; Bolivia: Santa Cruz de la Sierra; Ecuador: Achpiyacu. Type in British Museum.

Dated specimens September to April inclusive.

This seems to be a well marked and fairly constant race in Central Brazil, and two specimens taken by Buckley at Achpiyacu in Ecuador also belong here, but Bolivian examples are mostly intergrades. Seitz' figures named *eunice* belong to *esora*.

(e) *P. eunice drypetis* Godm. and Salv.

♂. Fore wing somewhat shorter than in the other races, the outer margin straighter. Upperside: Fore wing basal patch almost all fulvous, only shading to yellowish at distal end of spot in 2; black

streaks on median vein and inner margin faint or absent; yellow subapical band as in *eunice eunice*; at least two yellow preapical spots. Hind wing discal black band distinctly macular, the spots sometimes very small.

Underside differing from *eunice eunice* in the absence of the black median streak on fore wing.

♀. Only differing from the same sex of *eunice eunice* in the absence of the black median streak of fore wing.

Habitat.—Guatemala: Central Valleys; Panama: Lion Hill (type, in British Museum); Colombia: Manaure, Rio San Juan, Puerto Berrio, Crystalina in Antioquia.

Dated specimens June, July and August.

This seems to be a fairly constant form in Colombia and Panama, but the single Guatemalan example in the British Museum is the only one known from that country.

(f) *P. eunice mechanitis* Godm. and Salv.

♂, ♀. Wings longer than in the other races. Fore wing basal patch almost wholly fulvous, only shading to yellow at distal end of the spot in 2; black streaks present on median vein and inner margin; yellow subapical band narrow, more regular than in *eunice eunice*, its inner edge nearly straight; beyond it two or three rather large yellow subapical spots united so as to form a short band. Hind wing discal black band entire, showing no signs of dissolving into spots.

Habitat.—Nicaragua: Chontales (type, in British Museum); Costa Rica: Port Limon, Guapiles.

A rare form, of which I have only seen seven examples, including a pair taken by myself at Port Limon in October.

Valve of *P. eunice eunice* rather narrower than that of *P. clio*. Uncus (pl. iii, fig. 21) more abruptly contracted at the sides. Saccus with the single pointed projection which seems to be characteristic of this section.

94. *P. erysice* Geyer.

Melinaca erysice Geyer, in Hübn., *Zutr. Ex. Schm. f.* 717, 718 (1832).

(a) *P. erysice etesia* subsp. nov

P. erysice erysice Geyer.

Exp. 58 mm.

♀. Upperside: Fore wing black; a fulvous basal patch occupying basal part of cell and a large part of cellule 1b, and, contiguous with it, pale yellow spots at the bases of 2 and 3 and a broad yellow bar at distal end of cell, the latter separated from the fulvous basal area by a broad bar of black; a broad subapical band of pale yellow, 5—6 mm. wide, extending from vein 4 to costal margin; a round, yellow post-discal spot in 2; three small white submarginal spots near apex. Hind wing fulvous, with black subcostal, discal and marginal bands each about 2 mm. wide; the space between the subcostal and discal bands pale yellow; marginal band marked with a submarginal series of small white spots.

Underside: General pattern as above. Fore wing yellow spot at base of 2 fused with the postdiscal spot in the same interspace; a complete submarginal series of white spots, that in 3 the largest. Hind wing discal black band distinctly macular; submarginal spots larger.

Habitat.—Brazil: Bahia.

Allied to *P. eunice* Hübn. but differing essentially in the fore wings having a broad black bar in the cell but no black streak along median vein.

P. erysice erysice is one of the rarest forms of the genus. A single ♀ from the Felder collection in the Tring Museum, labelled "Bahia," is the only example I have seen; this agrees very fairly with Geyer's fig., the sex of which cannot be determined, only the latter has considerably narrower fore wings and only two submarginal (preapical) spots. The locality of the type was given as "South America."

(a) *P. erysice etesia* subsp. nov. (pl. i, fig. 8, ♂; 9, ♀).

Exp. ♂ 45—50, ♀ 55—57 mm.

♂. Upperside: Fore wing yellow spots contiguous to basal patch in 2 and 3 often clouded fulvous; subapical band more or less dusted with fuscous, the distal end of the spot in 4 separated so as to form a round postdiscal spot similar to that in 2; submarginal spots yellow, the series generally complete. Hind wing subcostal and discal black bands united anteriorly, the space between them fulvous, not yellow; submarginal spots yellow.

Underside: Fore wing subapical band not dusted fuscous; submarginal spots yellow. Hind wing as in *erysice erysice*. ♀ Larger

than ♂, wings broader. Fore wing subapical band broader, not dusted fuscous, the spot in 4 entire or imperfectly divided, extended to base of interspace, so that it becomes contiguous with the spot in 3, which is also clear yellow. Hind wing black subcostal and discal bands not united anteriorly. Submarginal spots of fore wing yellow above and below, the series complete.

Habitat.—French Guiana: St. Jean du Maroni.

Type ♂, allotype ♀ and 6 co-types in the British Museum; two ♀ ♀ co-types in Tring Museum.

95. *P. pelonia* Hew.

Eresia pelonia Hew., *Ex. Butt.* i, *Eresia*, t. 1, f. 3, ♂ (1852); *Phyc. pelonia* Staud., *Ex. Schmett.* i, p. 92 (1888); Rüb. in Seitz' *Macrolep.* v, p. 446 (1913); *Eresia pelonia* Seitz l.c. t. 92, f. B4, ♂ (1913).

(a) *P. callonia* Staud., *Ex. Schmett.* i, p. 92, t. 36, ♂ (1888); Rüb. in Seitz' *Macrolep.* v, p. 447, t. 88, f. 11, ♂ (1913).

= *E. pelonia* Hew., *Ex. Butt.* iv, *Eresia*, t. 8, f. 65, ♂ (1870).

(b) *P. pardalina* Rüb. in Seitz' *Macrolep.* v, p. 447, t. 90, f. H6, ♂ (1913).

(c) *P. pardalina* subsp. *apicalis* Rüb. in Seitz l.c. p. 447, t. 90, f. I1, ♂ (1913).

(d) *Eresia ithomiola* Salv., *Ann. Mag. Nat. Hist.* (4), iv, p. 171 (1869); Druce, *Proc. Zool. Soc.* 1876, p. 221.

= *E. pelonia* Hew., *Ex. Butt.* iv, *Eresia*, t. 8, f. 66, ♀ (1870).

= *P. murena* Staud., *Ex. Schmett.* i, p. 92 (1888); Rüb. in Seitz' *Macrolep.* v, p. 447 (1913); *Eresia murena* Seitz l.c. t. 92, f. C1, ♀ (1913).

(e) *P. murena* subsp. *heliconina* Rüb. in Seitz l.c. p. 447 (1913).

= *Eresia pelonia* Hew., *Ex. Butt.* iv, *Eresia* t. 8, f. 67, ♀ (1870).

= *P. pelonia* (sic!), Seitz' *Macrolep.* v, t. 90, f. I3, ♀ (1913).

(f) *Eresia callonioides* Strand, *Archiv f. Naturg.* 1912, Pt. 9, p. 178.

(g) *P. pelonia f. hewitsonii* form. nov.

= *P. pelonia* Hew., *Ex. Butt.* iv, *Eresia*, t. 8, f. 64, ♀ (1870).

P. pelonia pelonia Hew.

Exp. ♂ 50—55, ♀ 55—60 mm.

♂. Upperside: Fore wing black; a large fulvous basal patch occupying the cell, the greater part of cellules 1a—b and the base of 2,

divided by a thick black streak along median vein; a broad oblique subapical band of clear pale yellow from vein 3 to costa, the spot in 2 more distal than the others and placed somewhat at an angle to them; this band separated from the basal patch by two large round black spots, one on the discocellulars, the other in 3, the two spots generally well separated but sometimes contiguous if large; sometimes a small yellow discal spot in 2; no preapical spots. Hind wing fulvous, with subcostal, discal and marginal black bands each 2—3 mm. wide; discal band entire or macular; marginal band generally macular, at any rate anteriorly, the spots in 4—7 often centred with small white submarginal spots; in some examples a complete series of submarginal white dots is present, and in some, as in the type, the black marginal spots are quite small and widely separated.

Underside nearly as above but on hind wing there is always a complete submarginal series of round or triangular white spots.

Antennae pale yellow, base blackish.

♀. Similar to ♂ but larger, wings broader.

Habitat.—Upper Amazon: São Paulo da Olivencia; Ecuador: Rio Pastazza, Rio Verde, Zamora (3,000—4,000 feet), Archidona Sarayacu; Peru: Chanchamayo, Huayabamba, Perene, Rio Chachapoyas (3,500 feet), Chaquimayo. Type in British Museum from Ecuador.

Dated specimens April, December.

This is one of the most variable species of the whole genus, as may be seen from the five figures of Hewitson and the six of Seitz. The species may be distinguished from *P. eunice* by the submarginal white spots on the hind wing beneath being round or triangular, not lunular or transverse; the cilia of fore wing have no white incisions. None of the forms are geographically separated, but fly together in the same districts and are connected by all intergrades; the ♀ ♀ are rare and the ♂ ♂ not very abundant.

(a) *P. pelonia* f. *callonia* Staud.

♂. Similar to *pelonia pelonia* but fore wing with a variable number, generally 4—6 small yellow preapical spots between the yellow subapical band and the apex.

Habitat.—Peru: Pebas (type, in Berlin Museum), Jurimaguas, Rio Chachiyacu near Iquitos; Ecuador: Rio Napo.

Dated specimens November, December.

(b) *P. pelonia* f. *pardalina* Rüb.

♂. Similar to *f. callonia* except that the subapical band of fore wing is wholly fulvous or only slightly tinged with yellowish.

Habitat.—Peru: Pebas (type, in Tring Museum), Chaquimayo.

Dated specimens December.

(c) *P. pelonia* f. *apicalis* Rüb.

♂. Fore wing subapical band fulvous, as in *f. pardalina*, but preapical spots absent. Hind wing with well separated black bands.

Habitat.—Peru: Rio Chuchurras (type, in Tring Museum), Yahuaro, Palcazu, Chaquimayo.

Dated specimens February and March.

(d) *P. pelonia* f. *ithomiola* Salv.

♂, ♀. Fore wing subapical band fulvous, completely fused with the basal patch, which is very broad and in cellules 1—3 often extends to outer margin; the two black spots enclosed by it are widely separated, that in 3 often small and occasionally wanting; no preapical spots. Hind wing discal and marginal black bands completely fused together so as to form a large black patch which, as a rule, is also partly or completely fused with the subcostal band, leaving only a large patch of fulvous at anterior angle, where it is marked with three well-separated black marginal spots; submarginal white spots seldom present above and often absent beneath also. On the underside a few yellow scales generally remain in the subapical band of fore wing.

Habitat.—Peru: Cosnipata Valley (type, in British Museum), Chanchamayo, La Union, Rio Huacamayo (2,000 feet), La Merced, Pozzuzo, Rio Perene, Rio Colorado (2,500 feet), Chaquimayo (2,000—3,000 feet), Yahuaromayo; Ecuador: Aguano, Curarai, Rio Pastazza; Bolivia: Yungas de la Paz.

Dated specimens February, March, June, December.

One of the commonest forms, and highly interesting from its mimetic resemblance to *Hyposcada fallax* Staud., *Heliconius bicolorata* Butl., &c.

(e) *P. pelonia* f. *heliconina* Rüb.

♀. Fore wing subapical band yellow, sometimes clouded with fulvous; beyond it four or five large, somewhat triangular yellow preapical spots near outer margin and two smaller ones more proximal in

4 and 5. Hind wing with discal and marginal black bands fused together but well separated from the subcostal band; the white submarginal spots may be present or absent.

Habitat.—Peru: Pebas (type, in Tring Museum); Ecuador: Rio Verde.

The insect figured by Scitz as *P. heliconina* on pl. 91 has nothing to do with this, but appears to be a ♀ of *P. alsina*.

(f) *P. pelonia* f. *callonioides* Strand.

♀. Fore wing subapical band fulvous, more or less fused with basal patch; yellow preapical spots present but small. Hind wing with the three black bands well separated.

Habitat.—S.E. Peru. Type in the Hill Museum, Witley.

The last two forms are known only in the ♀, and perhaps correspond to the ♂ forms *callonia* and *pardalina* respectively. Rothschild and Jordan have pointed out in their admirable monograph of the genus *Charaxes* that when a species is polymorphic it cannot be said that any form of ♀ belongs to any particular form of ♂.

(g) *P. pelonia* f. *hewitsonii* form. nov.

♀. Fore wing subapical band well separated from basal patch, the spot in 3 only represented by a few scattered yellow scales, those in 4—6 yellow, small, separated by the veins; the two black spots internal to the band completely fused together; no preapical spots. Hind wing as in *f. ithomiola* Salv., all the three black bands being fused together.

Habitat.—Ecuador. Type in British Museum.

In addition to the foregoing there are some other intermediate forms of *P. pelonia* to which I do not consider it advisable to give names unless they prove to be of frequent occurrence. In a ♀ in the British Museum, from Ecuador, the fore wings are marked as in *f. heliconina*, but on the hind wing the subcostal and discal bands are well separated and there are no black marginal markings at all.

The male armature of *P. pelonia pelonia* resembles that of *P. letitia* and does not differ very markedly from that of *P. ewnice*.

96. *P. eranites* Hew.

Eresia eranites Hew., *Ex. Butt.* ii, *Eresia*, t. 2, f. 8—10, ♂, ♀ (1857); Godm. and Salv., *Biol. Cent.-Am. Rhop.* i, p. 185 (1882); *ibid.* l.c. ii, p. 673 (1901); *Phyc. eranites* Staud., *Ex. Schm.* i, p. 93 (1888); Rüb. in Seitz' *Macrolep.* v, p. 446 (1913).

= *Eresia evanides*, Seitz l.c. t. 92, f. C5, D1, 2 (1913).

= *E. carne* Seitz (non Doubl. and Hew.), *Macrolep.* v, t. 92, f. D3, ♂ (1913).

= *P. eranites* subsp. *mejicana* Rüb. in Seitz l.c. p. 446 (1913).

Exp. ♂ 35—48, ♀ 52—55 mm.

♂. Upperside black; markings deep fulvous, unicolorous. Fore wing with a broad basal stripe or patch occupying a large part of cellule 1b, about two-thirds of 2, the base of 3 and generally the lower half of cell, but in darker specimens not extending into the cell; a bent subapical band composed of two fairly large subcostal spots in 5 and 6 (often followed by a streak on costa) and two large, oblong postdiscal spots in 3 and 4, the latter distinctly separated from the spot in 5; from one to three small preapical dots are generally present, and sometimes there are 5 or 6, arranged in two series. Hind wing median band 3—4 mm. wide, generally confluent anteriorly with a single submarginal spot at anterior angle; a rather variable postdiscal stripe, sometimes present only posteriorly as a thin line, sometimes continued so as to join the median band near vein 6; the two submarginal spots at anterior angle rarely completely separated from the median band, the others absent or represented by very thin lunules.

Underside: Fore wing basal patch paler fulvous; subapical band ochraceous, formed as above; apex dark brown with five or six preapical spots in two series, the more proximal ones generally white, the submarginal ones ochraceous; sometimes one or two other small submarginal spots near hinder angle. Hind wing base and median band ochraceous, separated by a dark brown subbasal band; black discal band extending only to about cellule 5, macular, the spots sometimes defined with white; outer margin dark brown, the submarginal lunules distinct and white, except those at anterior angle, which are larger and diffused.

♀. Considerably larger than ♂. Upperside: Fore wing basal patch as in ♂ but varying from pale yellowish to fulvous in colour; subapical band nearly always pale ochraceous, formed of subcostal spots in 5 and 6 and a widely separated spot in 3, the spot in 4 being represented by two small spots forming a continuation of the preapical spots, which are eight in number, arranged in two series. Hind wing markings as in ♂ except that they are often paler fulvous or yellowish and that the postdiscal band is broader, always united anteriorly with median band.

Underside nearly as in ♂ but subapical band of fore wing differing

as above and distal part of median band of hind wing often scaled with rufous-brown.

Habitat.—Mexico: Cordoba (2,000 feet), Orizaba (4,000 feet), Jalapa, Omealca (2,000 feet), Atoyac, Cuesta de Misantla, Presidio; Guatemala: Polochic Valley, Cubilguitz, Palin (2,500 feet), Northern Vera Paz, Sinanja; Nicaragua: Chontales; Costa Rica: Port Limon, Juan Vinas (2,500 feet), Cache; Panama: Chiriqui (2,000—4,000 feet), Santa Fé, Bugaba; Colombia: Manaure, Muzo, La Mesa (4,000 feet), Cali, San Rafael (3,500 feet), Rio Dagua; Venezuela: Tachira; Ecuador: Huigra (4,000 feet), Chimbo, Macas. Types in British Museum from New Granada.

Dated specimens, January, March, May, June, November.

A widely distributed and common species. The ♂♂ vary a little in the width of the fulvous bands, some having them even broader than in Seitz' fig. named "*evanides*," whilst others have them as narrow as in the fig. erroneously called "*carne*" ♂ on the same plate, but these variations have no local constancy; dark specimens seem to be the rule in Western Ecuador and Western Colombia, but some from Costa Rica are equally dark. In the ♀ the fulvous markings are sometimes almost yellow, and in an example from Bugaba in the British Museum the black discal band of hind wing is almost obsolete. The latter collection includes two ♂♂ labelled "Cuba" and "Paraguay" respectively, but these localities are doubtless incorrect.

I have treated the form from Presidio called *mejicana* by Röber as a synonym because I have typical specimens from the same locality and also because the description, "less black above, underneath more yellow," is worthless; there is not even any clue to the sex referred to.

Male armature resembling the *P. myia* group more than that of *P. eunice*. Valve (pl. iii, fig. 77) with a single rather long hook-like process at apex and the usual long process below apex. Uncus conical, the end nearly straight. Saccus with two rather short projections.

97. *P. casiphia* Hew. (pl. i, fig. 7, ♀).

Eresia casiphia Hew., *Equat. Lep.* p. 25 (1869); *ibid. Ex. Butt.* iv; *Eresia*, t. 9, f. 72, 73, ♂ (1870); *Phyc. casiphia* Rüb. in Seitz' *Macrolep.* v, p. 446 (1913).

Exp. ♂ 50—53, ♀ 54—58 mm.

♂. Upperside black; markings fulvous. Fore wing with basal stripe occupying the greater part of cellule 1b but hardly entering the cell; an oblique central band formed by a large, elongate spot in 2, a small

spot at base of 3 and a transverse spot at end of cell; a subapical band of three large spots of equal size in 4—6, these spots being slightly paler than the rest, somewhat yellowish. Hind wing with median band about 4 mm. wide at vein 2, slightly narrowed anteriorly; a postdiscal band about 2 mm. wide, extending from inner margin to cellule 5; two small white spots at anterior angle, sometimes obsolete; the black costal, discal and marginal bands united anteriorly.

Underside: Fore wing nearly as above but basal stripe broader, entering the cell; both the oblique bands yellow; a complete submarginal series of yellowish white spots. Hind wing base yellow, followed by a narrow fulvous subcostal streak and a broad black-brown subbasal band; median band largely or wholly whitish; black discal band sometimes terminating at vein 6; fulvous postdiscal band as above but sometimes continued to vein 7; outer margin brown with a submarginal series of rather large white spots edged with black.

♀. Upperside: Fore wing fulvous basal stripe a little broader than in ♂, entering the cell; oblique bands as in ♂ but pale yellow, sometimes slightly tinged fulvous; a complete submarginal series of pale yellow spots. Hind wing as in ♂ except that the fulvous median and postdiscal bands are a little broader and there is a complete submarginal series of whitish-yellow spots. Upperside as in ♂ but white submarginal spots larger.

Habitat.—Ecuador: Jorge (type, in British Museum); Balsapamba. A rather distinct species, but scarce and little known.

In British Museum three ♂♂; in coll. Hall two pairs taken at Balsapamba by R. Haensch.

98. *P. phillyra* Hew.

Eresia phillyra Hew., *Ex. Butt.* i, *Eresia*, t. 1, f. 1, ♀ (1852); Godm. and Salv., *Biol. Cent.-Am. Rhop.* i, p. 184 (1882); *ibid.* l.c. ii, p. 674 (1901); Seitz' *Macrolep.* v, t. 92, f. C3, 4, ♂ ♀ (1913); *Phyc. phillyra* Rüb. in Seitz l.c. p. 448 (1913).

= *Eresia ezorias* Hew., *Ex. Butt.* ii, *Eresia*, t. 2, f. 13, ♂ (1857).

Exp. ♂ 52—62, ♀ 62—65 mm.

♂. Upperside black: markings deep fulvous, unicolorous. Fore wing a broad basal patch occupying lower half of cell, the greater part of cellules 1b and 2, and the lower half of cellule 3, almost reaching outer margin; an oblique subapical band formed of three long spots in 4—6 and a short spot or streak on costa; three or four small preapical spots and one submarginal spot in 3. Hind wing median band about

4 mm. wide, extending to vein 8, but the anterior end often separated by vein 7 being black; a postdiscal band about 4 mm. wide at inner margin, narrowing to a point at vein 6, where it usually terminates, but is sometimes continued so as to unite with median band; sometimes a submarginal spot is separated in cellule 6, but more often it is fused with the median band.

Underside: Fore wing basal patch paler than above, its distal end sometimes yellowish; subapical band and preapical spots pale yellow, the latter much larger than above. Hind wing base and median band yellowish; black discal band not joined anteriorly to marginal border; fulvous postdiscal band often clouded with whitish; submarginal spots 1b—5 white, narrow, those in band 7 larger, pale yellow.

♀. Upperside: Fore wing fulvous basal patch narrower and shorter than in ♂, seldom extending into 3, the section in 2 distally yellowish and often partly broken into two spots; subapical band pale yellow, the spots shorter than in ♂; a complete submarginal series of yellow spots, the three at apex larger. Hind wing general pattern of ♂ but discal black band always joined anteriorly to marginal border; fulvous postdiscal band broader; a submarginal series of pale yellow spots, the two at anterior angle larger, the others small, often obsolete.

Underside as in ♂ but fore wing differing as above.

Habitat.—Mexico: Cordoba (2,000—2,500 feet), Orizaba (4,000 feet), Jalapa, Omealca (2,000 feet), Atoyac, Oaxaca, Tabasco; Guatemala: Puerto Barrios, Polochic and Motagua Valleys, Telemán, Purula, Forests of Alta Vera Paz; Honduras. Types in British Museum.

Dated specimens March, June, July, October, November, December.

A very common species in Mexico and Guatemala but only on the Atlantic coast. Unlike most species of this section, it is gregarious, a number of specimens being generally found together. The ♂ is a fair mimic of *Eucides aliphera* Godt. and may be distinguished from all species except the allied *P. nigripennis* by the truncate apex and concave outer margin of fore wing. In the ♀, as in most of those forms which resemble the genus *Ceratinia* in markings, the antennae are often almost wholly pale yellow, but this is not a constant character, the yellow being confined to the extreme tip in some specimens. It is a significant fact, however, that here, as also in *P. alsina* and *P. eutropia*, these yellow antennae are found only in the *Ceratinia*-like ♀♀, never in the *Eucides*-like ♂♂, whereas in *P. pelonia* and *P. ithomoides*, the ♂♂ of which resemble *Ceratinia* and *Mechanitis*, the antennae are yellow in that sex also. Uncus of *P. phillyra* similar to that of *P. eunice*. Valve

rather broader, with a single process at apex and the usual long process below apex. Saccus with a single projection, shorter and blunter than in *P. eunice*.

99. *P. nigripennis* Salv.

Eresia nigripennis Salv., *Ann. Mag. Nat. Hist.* (4), iv, p. 170 (1864); Godm. and Salv., *Biol. Cent.-Ann. Rhop.* i, p. 186, t. 22, f. 15, 16, ♂ (1882); *Phyc. nigripennis* Rüb. in Seitz' *Macrolep.* v, p. 447, t. 90, f. I 4, ♂ (1913).

= *Eresia dimorphina* Butl., *Cist. Ent.* i, p. 78 (1872); *ibid.*, *Lep. Ex.* p. 182, t. 63, f. 1, ♀ (1874); Butl. and Druce, *Proc. Zool. Soc.* 1874, p. 350; Rüb. in Seitz' *Macrolep.* v, p. 447 (1913).

Exp. ♂ 50—55, ♀ 55—62 mm.

♂. Wings shaped as in *P. phillyra* Hew. Upperside: Fore wing black; basal stripe absent or represented by diffused reddish-fulvous scaling below median vein; the other markings very pale yellow, sometimes almost whitish, consisting of a discal spot in 2, sometimes elongate and double, a subapical band of three small, widely separated spots, in 4—6, the two latter streak-like and often followed by a streak on costa, three small preapical spots, and submarginal spots in 2 and 4. Hind wing reddish-fulvous with rather narrow black costal and marginal borders united at anterior angle and there marked with two fairly large yellow submarginal spots, often tinged with fulvous.

Underside: Fore wing with broad reddish-fulvous basal stripe occupying the basal half of cellule 1b and lower half of cell; yellow spots as above but mostly larger, the preapical spots streak-like, the submarginal series complete. Hind wing as above except that the extreme base is yellow, the fulvous central area largely clouded with whitish, and in addition to the two large spots at anterior angle there are small white submarginal spots in 1b—5.

♀. Very similar to ♂ but wings broader. Fore wing above with diffused fulvous basal stripe generally better marked, extending both above and below median vein; yellow spots a little larger and brighter in colour, the submarginal series complete. Hind wing and underside as in the ♂.

Habitat.—Costa Rica: Cache, Cartago, Juan Vinas (2,500 ft.) Carrillo. Type in British Museum.

Dated specimens January, April, May, September, October.

Although very different in appearance, *P. nigripennis* is evidently very closely related to *P. phillyra*, which it replaces in Costa Rica. It

is, however, a much rarer species, generally found singly. Both sexes have a certain resemblance to *Napeogenes amara* Godm., a common species in the same localities.

Neither *P. phillyra* nor *P. nigripennis* has yet been found in Nicaragua, where an intermediate form might possibly occur. The male armature of the two species appears quite similar.

CORRIGENDA.

(Vol. III, Part 2.)

Page 183: *Thermidarectia* gen. nov. sinks to *Crocomela* Kirby.

T. thermidooides sp. nov. sinks to *thermida* Hering, 1926.

(We are obliged to Dr. M. Hering of the Berlin Museum for pointing out the identity of his species with our own.)

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THE

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